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ENVIRONMENTAL IMPACT STATEMENT
FOR
SHUQUALAK CREEK WATERSHED PROJECT

NOXUBEE AND KEMPER COUNTIES, MISSISSIPPI

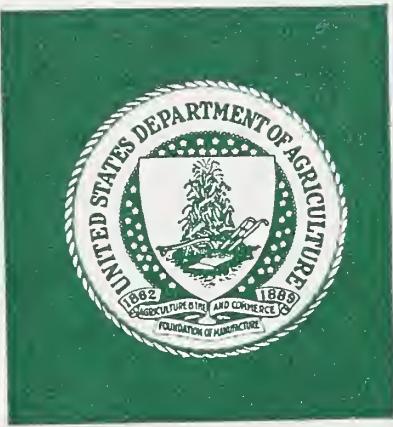
AUGUST 1975

PREPARED BY
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Jackson, Mississippi 39205

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Shuqualak Creek Watershed Project
Noxubee and Kemper Counties, Mississippi

FINAL ENVIRONMENTAL IMPACT STATEMENT

W. L. Heard
State Conservationist
Soil Conservation Service

Sponsoring Local Organizations:

Shuqualak Creek Water Management District
Shuqualak, Mississippi 39361

Noxubee County Soil and Water Conservation District
Macon, Mississippi 39341

Kemper County Soil and Water Conservation District
DeKalb, Mississippi 39328

August 1975

DEC 29 1978

CATALOGING • PREP

PREPARED BY

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Jackson, MS 39205



USDA ENVIRONMENTAL IMPACT STATEMENT

Shuqualak Creek Watershed Project
Noxubee and Kemper Counties
Mississippi

Prepared in Accordance with
Sec. 102(2) (C) of P.L. 91-190

Summary Sheet

- I. Final
- II. Soil Conservation Service
- III. Administrative
- IV. A project for watershed protection and flood prevention in Noxubee and Kemper Counties, Mississippi, to be implemented under authority of the Watershed Protection and Flood Prevention Act (P.L. 566, 83rd Congress, 68 Stat. 666), as amended.
- V. Environmental Impacts and Adverse Environmental Effects: The environmental impacts of the proposed project are to reduce average gross erosion rates by 26 percent, stabilize 150 acres having critical erosion problems, reduce downstream sediment delivery by 31 percent, reduce flood damages by 75 percent, increase net income of farm operators, and create additional fishery and waterfowl habitat. There will be about 67 acres of land cleared for the sediment pools, the dam and spillway areas, and along the channel work rights-of-way. There will be a loss of or reduced use for agricultural production from 165 acres of cropland, 185 acres of pastures, 517 acres of forest land, and 52 acres of other land. In addition, there will be a loss of 153 acres of wildlife habitat on lands to be in the sediment pools and there will be some temporary water and air pollution during construction stages.
- VI. Alternatives Considered:
 - 1. Conservation land treatment only.
 - 2. Conservation land treatment and three floodwater retarding structures.
 - 3. Conservation land treatment, three floodwater retarding structures, and channel work.
 - 4. Conservation land treatment, three floodwater retarding structures, and reduced channel work.
 - 5. Conservation land treatment and channel work.
 - 6. Conservation land treatment, two floodwater retarding structures, and channel clearing.
 - 7. Conservation land treatment, flood proofing, and conversions.
 - 8. No project



VII. Agencies From Which Written Comments Were Received:

U. S. Department of the Army
U. S. Department of Health, Education, and Welfare
U. S. Department of the Interior
U. S. Department of Transportation
Environmental Protection Agency
Federal-State Programs, Office of the Governor
Golden-Triangle Planning and Development District

VIII. Draft statement transmitted to CEQ on February 7, 1975.
Date



USDA SOIL CONSERVATION SERVICE
FINAL ENVIRONMENTAL IMPACT STATEMENT
for
Shuqualak Creek Watershed
Noxubee and Kemper Counties, Mississippi

Installation of this project constitutes an administrative action. Federal Assistance will be provided under authority of Public Law 83-566, 83rd Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

Shuqualak Creek Water Management District
Noxubee County Soil and Water Conservation District
Kemper County Soil and Water Conservation District

PROJECT OBJECTIVES AND PURPOSES

The project objectives are to reduce erosion rates, stabilize critical areas, reduce downstream sediment delivery, reduce flood damages about 75 percent, increase net income of farm operators, and create additional fishery and waterfowl habitat in such a way as to minimize adverse effects to the environment. The project will provide watershed protection and flood prevention.

PLANNED PROJECT 1/

Land Treatment - Land treatment measures were considered as a basic element in formulating this watershed project and are essential to its successful functioning. The project provides for technical assistance for accelerating the establishment of land treatment measures throughout the 21,610 acre watershed area. At the end of the five year installation period, about 6,930 acres of land will have received adequate treatment as measured by Soil Conservation Service standards. This is in addition to the lands of the watershed already adequately treated and the additional lands that will be treated after the end of the project installation period. The 6,930 acres to be adequately treated during the installation period will consist of about 1,130 acres of cropland, 1,650 acres of pastureland, 4,000 acres of forest land, and 150 acres of critically eroded lands. Other areas will receive partial treatment.

Adequate treatment will be accomplished through use of land treatment systems which are adaptable to each of the land treatment units. For example, a land treatment system for a bottom land-cropland unit will consist of the following measures: conservation cropping system, odd area wildlife planting, row arrangement, crop residue management, drainage field ditches and diversions. For upland-cropland, the treatment measures are:

1/ All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigations by the Soil Conservation Service and Forest Service, U. S. Department of Agriculture.

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conservation cropping system, odd area wildlife plantings, contour farming, crop residue management, terracing, and grassed waterways or outlets.

Conservation cropping systems are the growing of crops in combination with needed cultural and management measures and include crop rotations. Contour farming is the farming of sloping cultivated land in such a way that plowing, preparing land, planting, and cultivating are done on the contour. Crop residue management (crop residue use) is the using of plant residues to protect cultivated fields during critical erosion periods. A diversion is a constructed watercourse with a supporting ridge on the lower side constructed across the slope so as to keep hill water from running directly down onto bottom land. A drainage field ditch is a graded ditch for collecting excess water within a field. A grassed waterway or outlet is a natural or constructed watercourse or outlet shaped or graded and established in suitable vegetation as needed for the safe disposal of runoff from a field, diversion, terrace, or other structure. Row arrangement is the arrangement of row crops in such a way as to facilitate and control row drainage. A terrace is an earth embankment or ridge and channel constructed across the slope for the orderly removal of water from sloping cultivated lands. Odd area wildlife food and/or cover is the practice of making wildlife food and cover plantings in odd size areas and corners of fields.

For bottom land-grassland, the treatment measures are: pasture planting, pasture management, brush control, pond construction, fish pond stocking and management, fencing, and drainage field ditches. For upland-grassland, the treatment measures are: pasture planting, pasture management, pond construction, fish pond stocking and management, brush control and fencing.

Brush control is the killing, suppressing, or managing brush by mechanical, chemical, or biological means or by controlled burning on all areas except cropland or woodland. Fish pond stocking and management is developing or improving impounded water to produce fish for domestic use or recreation. Fencing is enclosing or dividing an area of land with a suitable permanent structure that acts as a barrier to livestock, big game, or people. Pasture planting and management is establishing or reestablishing stands of adapted species or perennial, biennial, or reseeding forage plants and the proper use and treatment of pastureland. A pond is a water impoundment made by constructing a dam or embankment or by excavating a pit or "dugout".

The U. S. Forest Service in cooperation with and through the Mississippi Forestry Commission will furnish the technical assistance necessary to plan and apply the forestry measures.

Forest land treatments consist of tree plantings, thinning, stand improvement, salvage and harvest cutting, wildlife habitat improvement, and preservation practices, and multiple use management. Tree planting is the planting of tree seedlings or cuttings. Thinning is the removal of some of the trees so that the remainder has room for growth. Stand improvement is removal of unmerchantable or unwanted trees, shrubs, and vines so that the remaining trees will contain a higher percentage of merchantable or wanted trees. Salvage and harvest cutting is the cutting of damaged trees and the ready to



harvest trees. Wildlife habitat improvement is the management of the forest or portions of the forest in such a way as to maintain and/or improve the wildlife habitat potential.

The primary goal of the forestry management program is to enhance and develop the watershed needs and objectives. The forest lands will be managed to fulfill timber, wildlife, and recreation needs to the level where such management is compatible with sound watershed management.

The critically eroding lands will either be seeded to grasses and legumes or planted to trees. In either case, the site will be prepared for planting, fertilized, mulched where necessary, and growth protected.

Conservation plans will be developed by the individual farm operator and the appropriate Soil and Water Conservation District for about 16 of the 50 farm operating units in the watershed. About 18 of the now existing and active conservation plans will be revised to reflect updated needs. The soil surveys and other inventories and data necessary to the development of the plans will be made available through going programs supplemented with accelerated programs developed with PL-566 funds. The development and revision of the conservation plans and technical assistance for installation of the land treatment measures will also be accomplished through going programs supplemented by accelerated programs developed with PL-566 funds.

Structural Measures - The structural measures included in this environmental statement include floodwater retarding structures and channels.

Floodwater Retarding Structures - Two floodwater retarding structures are planned for the control of damaging floodwaters and sediment. See Project Map, Appendix C. A floodwater retarding structure is a compacted homogenous earth filled dam with provisions for permanent storage of sediment and temporary retardation of runoff water from the drainage area above the structure. All earthen embankments will be vegetated with grasses and/or legumes with high value for soil stability for the embankment and value for wildlife food and cover. Examples of types of plants that are considered for planting are grasses such as Bermuda, Bahia, and Fescue, and legumes including Common and Sericea Lespedeza. However, these are not the only plants considered and all plants that will first provide soil stabilization and secondly wildlife food and cover values will be considered. The structures in this plan are designed for release of water from any of four outlets. Three of these outlets flow into an outlet pipe under the dam. The lowest outlet is a water control slide gate (drain valve) at the elevation of the outlet pipe. See Figure 1.

This outlet is a fixed gate that remains closed at all times unless it is necessary or desirable to remove the sediment pool water. Some reasons for this removal are repairs on the dam or outlet pipe, vegetative control in the sediment pool area, and fish or waterfowl management. The next higher elevation outlet is the low stage principal spillway outlet located in the vertical riser that connects to the outlet pipe on the upstream side of the dam. This outlet is at the elevation of the top of the sediment pool. The third outlet, the high stage principal spillway, is the top of the vertical riser which is set at the elevation of the top of the low stage floodwater detention pool. The fourth outlet is the emergency spillway which is at the top of the floodwater detention pool.



The low stage principal spillway outlet, the high stage principal spillway outlet, and the emergency spillway are ungated. The desired flow for downstream flood protection from the low stage principal spillway riser is regulated by the size of hole constructed in the vertical riser. The desired flow for downstream flood protection and dewatering from the high stage principal spillway is regulated by the size of outlet pipe or conduit under the dam. The emergency spillway is proportioned by width and distance between its crest and the top-of-dam so as to bypass water from large or unusual storm events without overtopping or damaging the dam.

The principal spillways will be constructed on yielding foundations. The conduit used will be reinforced concrete. The emergency spillways will be constructed in earth and vegetated with grasses and/or legumes with high value for wildlife food and cover. Included for consideration for planting will be such grasses as Bermuda, Bahia and Fescue, and legumes including Common and Sericea Lespedeza. There is ample fill material available at the structure with the material to be obtained from the emergency spillway and structure pool areas.

The floodwater retarding structures planned will provide 5,555 acre feet of floodwater detention capacity. This is equivalent to 9.30 inches of runoff from their combined drainage area of 11.42 square miles or 3.08 inches of runoff from the entire watershed. They will impound in detention storage from 7.81 to 9.56 inches of runoff from their respective drainage areas which is 34 percent of the watershed. The control provided by the principal spillway and retarding storage will be for a one percent chance event. Emergency spillways on the two structures will function for all events greater than the one percent chance event.

The two floodwater retarding structures are designed for 100 year sediment storage accumulation. Volume allowances for sediment were made on the basis of 80 percent submerged and 20 percent aerated. Storage volume for the 100 year aerated sediment was made available in the reservoir flood pool areas. Within the area of the floodwater retarding structures, there will be about 37 acres of forest land to be cleared. The entire 37 acres will be within the sediment pool areas. There will be a total of 153 surface acres of water initially impounded within the sediment pools for these two floodwater retarding structures. There will be a total of 738 acres of lands inundated at the maximum stages with the passage of the design storm through the retarding structures. About 90 acres of the flood pool of FWRS No. 1 will be on the Meridian Naval Air Base - Auxiliary Field OLF Alpha. The Navy interposes no objection to the proposed dam location, stating that normal operations of the field would not be impaired. The dams vary in height from 34.0 to 36.7 feet. Sediment pools range from 47 to 106 acres. The range of surface acres in the temporary flood pools, including the sediment pool, is 203 to 525 acres.

Selected trees will be marked to be retained within the sediment pools to provide fish cover and to reduce bank erosion caused by wave action. No more than five to ten percent will be retained. Artificial wood duck boxes will be constructed and placed, one for each eight acres of permanent water, around the perimeter of the sediment pools.

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Possible adverse effects to the stream ecosystem will be mitigated by the installation of cool-water flow through devices in the outlet structures. Orifices in Structures Nos. 1 and 2 will maintain minimum stream flows of 0.5 and 0.3 cfs and enhance stream fisheries resources.

A water level control device, a vertical sliding gate, will be installed in each of the two floodwater retarding structures. These gates will be incorporated into the structure designs which will allow the permanent pool levels to be drawn down from two to three feet. The gates will also be used to facilitate the planting of millet for waterfowl, to manage fish populations, and to control vegetation. These devices in the floodwater retarding structures will partially mitigate the damages to the stream fishery resource caused by the channel work. This will also make waterfowl management possible in the reservoirs.

Channels - There are approximately 5.2 miles of flood prevention channel work planned in this watershed. The purpose of the channel work is to provide additional capacity for disposing of controlled outflow from the floodwater retarding structures and runoff from uncontrolled portions of the watershed and to get the channels into a proper flow condition so that future maintenance can be undertaken. These channels, as planned, will supplement the floodwater retarding structures, and will further reduce flood stages, frequency of flooding, and flood plain area inundated. The channel is designed to carry the outflow from the floodwater retarding structures plus the 2-year frequency storm runoff from the uncontrolled drainage areas. The hydraulic grade line used in channel design is based on average low ground elevations of flood plain areas served by the channel.

Planned channel work includes both the enlargement and the alignment of existing channels (channel work - type class II). The 5.2 miles of channel work consist of about 2.1 miles of channel enlargement and 3.1 miles of channel alignment. The characteristics of the streams to be modified by construction activities are described in the watershed resources environmental setting section of this plan.

Planned channel work on Shuqualak Creek and its tributaries by channels (see Project Map) is as follows: Channel No. 1 (Shuqualak Creek) is to be enlarged from station 166+50 to station 278+00, a distance of approximately 2.1 miles and newly aligned from station 278+00 to station 406+00, a distance of approximately 2.4 miles. Channel No. 3, which is located on a tributary of Shuqualak Creek, will be newly aligned from station 110+00 to station 145+00, a distance of approximately 0.7 miles. All channel work is located within the confines of reach No. 1. No channel work is planned on Channel No. 2.

Adverse effects to the stream fishery resource have been carefully considered in planning channel work features. Planned channel measures have been kept to an absolute minimum to achieve flood control objectives. All areas to be cleared for construction will be revegetated as soon as reasonably possible. The vegetative measures will be included in the construction contracts, and will include grasses, shrubs, and/or legumes with high value for wildlife food and cover. Included for consideration for planting will be such grasses as



Bermuda, Bahia, and Fescue, and such legumes as Common and Sericea Lespedeza, and shrubs such as Sawtooth Oak and other shrubs. Construction will be scheduled to provide the maximum length growing season practical to allow reestablishment of the vegetation. Where practical, existing topsoil will be stock piled and respread over spoil banks before reseeding.

Construction measures will include the temporary seeding of inside slope channel banks where the natural vegetation and/or the banks are disturbed during construction. Permanent vegetation will be established on the spoil banks, berms, disposal areas, and maintenance roads through a seeding and fertilization program. A 50-foot strip of wildlife plantings (sawtooth oak and other suitable wildlife shrubs) will be planted on the north side of the channel from about station 166+50 to 278+00, from station 278+00 to about station 310+00, on one side from about station 310+00 to about station 388+00, and on both sides from about station 388+00 to station 406+00. Several different wildlife food plants are available for planting on construction areas and in wildlife strips. Among those that will be considered for planting are Sawtooth Oak, Autumn Olive, Russian Olive, Tartartion Honey-suckle, Bicolor Lespedeza, and Cretagus. Construction is expected to be accomplished from one side between stations 166+50 to 278+00 and 310+00 to 288+00 on Channel No. 1 and station 110+00 to 200+00 on Channel No. 3. Sediment traps will be installed in the proper location to help control sedimentation during construction and until aged channel conditions are re-established. The upper ends of the cutoffs of the old meandering channel resulting from the channel realignment between stations 278+00 and 406+00 will be filled and the lower ends left open. Since there was no significant fishery habitat in this reach under present conditions, the future development and/or use of these areas will be at the discretion of the landowners.

Pipe overfall structures will be installed as appurtenances to the channel work. These structures are planned in most cases in areas where the flood plain is open. Their function is to safely lower surface waters into the channel without bank degradation or erosion and sedimentation.

The right-of-way needs for the channel work are estimated at about 142 acres of which 112 acres are open land and 30 acres are in forest. It is estimated that about 30 acres of the forest acres will be cleared during construction.

There are no relocations or displacements resulting from the acquisition of land rights for the structural measures included in this watershed.

Installation Procedures - Structural Measures - Soil erosion, water, air, and noise pollution will be minimized by following SCS Engineering Memorandum-66 and applicable state guidelines related to erosion and pollution. Some of the measures to reduce erosion and sediment are: (1) limiting the exposure of erodible soils to the shortest time reasonably possible, (2) use of temporary vegetation where exposure time of erodible soils will be excessive, (3) retardation of runoff by mechanical means where necessary, and (4) trapping sediment in debris basins. Some of the measures which will be used to reduce water, air, and noise pollution are: 1. application of dust suppressors or water on haul roads and construction area for dust control, 2. use of temporary bridges or culverts on running streams, 3. careful handling of chemicals, fuel, lubricants,



sewage, etc., to prevent spillage, 4. maintenance of construction equipment engines, muffler, and exhaust systems in good working condition, 5. regulation of burning at construction sites to times when wind and burning conditions are proper, and 6. location of access and haul roads away from homes as much as possible.

The Federal Register, National Register of Historic Places, dated February 28, 1973, as corrected June 5, 1973, was consulted and no registered properties within this area were found.

The Reservoir Salvage Act of 1960 (PL-86-523; 74 Stat. 220) is applicable to this project because the sediment pool surface areas are larger than 40 acres. The Secretary of the Interior will be notified of this fact at the proper time.

The applicability of Section 404 of Public Law 92-500 (Federal Water Pollution Control Act Amendments of 1972) is now in litigation. It is not known at this time if there are 404 implications in this watershed. If Section 404 of Public Law 92-500 becomes applicable, then the local sponsors will take the necessary steps to fully comply with the law.

Land Use Changes - The following table illustrates the land use change brought about in the construction of the structural measures.

Land Use Table
Structural Measures ROW

Structural Measure (Name)	Present Condition			Future Condition			Net Change		
	Open:Forest		Water	Open:Forest		Water	Open	Forest	Water
	(Ac)	(Ac)	(Ac)	(Ac)	(Ac)	(Ac)	(Ac)	(Ac)	(Ac)
FWRS No. 1	:	:	:	:	:	:	:	:	:
Sed. Pool	79:	27:	0	0:	0:	106:	-79:	-27:	+106
Flood Pool	32:	397:	0	32:	397:	0:	0:	0:	0
Dam, etc.	19:	0:	0	19:	0:	0:	0:	0:	0
FWRS No. 2	:	:	:	:	:	:	:	:	:
Sed. Pool	37:	10:	0	0:	0:	47:	-37:	-10:	+ 47
Flood Pool	103:	53:	0	103:	53:	0:	0:	0:	0
Dam, etc.	20:	0:	0	20:	0:	0:	0:	0:	0
Channel No. 1	101:	28:	0	129:	0:	0:	+28:	-28:	0
Channel No. 3	11:	2:	0	13:	0:	0:	+ 2:	- 2:	0
Totals	402:	517:	0	316:	450:	153:	-86:	-67:	153

Operation and Maintenance - Land treatment measures on private land will be operated and maintained by landowners and operators under cooperative agreements with the Soil Conservation Districts of Noxubee and Kemper Counties. The operation and maintenance of these measures will be the financial responsibility of the individual operators and landowners. Operation and maintenance of critical area plantings will be financed by the Shuqualak Creek Water Management District from its regular maintenance funds.



Private forest land treatment measures will be maintained by the landowners and operators under agreement with the Noxubee and Kemper County Soil Conservation Districts. The Mississippi Forestry Commission in cooperation with the U. S. Forest Service will furnish the technical assistance necessary for operating and maintaining the forest land treatment measures under the going Cooperative Forest Management Program. They will also continue to furnish fire protection under the Cooperative Forest Fire Control Program.

The Boards of Supervisors of Noxubee and Kemper Counties will be responsible for maintaining the land treatment measures on Sixteenth Section Lands except where this land is under private lease. In these cases, the private leaseholder will be responsible for the maintenance of land treatment measures.

The Shuqualak Creek Water Management District will assume the responsibility of operating and maintaining the floodwater retarding structures and the flood prevention channels. Operation and maintenance funds will be secured through assessments as provided in Mississippi Senate Bill 1220, extraordinary session 1955. The estimated annual cost for operating and maintaining the floodwater retarding structures and flood prevention channels is about \$3,300. This includes replacement costs for overfall pipes and water level control devices.

The annual cash sum of approximately \$1,300 will be raised by the Shuqualak Creek Water Management District through annual assessment to defray the cash obligation of said project for operation and maintenance of structural measures and for replacement costs for parts of structures having a shorter life than 100 years. The balance of the annual operation and maintenance costs will be contributed as services in kind such as labor, equipment hire, and materials by the benefited landowners and operators of the watershed. These services will be arranged for by the Shuqualak Creek Water Management District.

The maintenance of the floodwater retarding structures will include removal of debris from principal spillways, maintenance of adequate vegetation on the embankments and emergency spillways, and repair of any damages resulting from flood events. There may be specific problems with beavers in the operation of these structures. Where this occurs, the District will seek advice and assistance from the Game and Fish Commission on how to handle the problem. The Shuqualak Creek Water Management District fully understands the requirements for adequate operation and maintenance, and arrangements will be made to satisfy these requirements.

The maintenance of the flood prevention channels will be accomplished by the use of sprays and/or labor and equipment to control noxious vegetative growth. This maintenance will assist in the promotion and growth of desirable vegetation for stream bank erosion control and wildlife habitat. Additional maintenance will include the removal of drifts, debris, and/or sediment bars as necessary.

Travelways for maintenance will be constructed as a part of the construction contract. These travelways will be adequate for movement of operation and maintenance equipment required for maintenance of the channels. They will be maintained as a part of the channel system.



The Shuqualak Creek Water Management District will operate and maintain the water level control devices on the two floodwater retarding structures. The operation and maintenance of these devices will be performed on a local contract basis at District expense. The Mississippi Game and Fish Commission will be consulted and the water level control devices will be operated in accord with their recommendations and project objectives. The District will encourage landowners to provide public use of the wildlife and fishing areas. If such public use is provided, the landowners will be responsible for providing adequate sanitary facilities as determined by the Water Management District Commissioners.

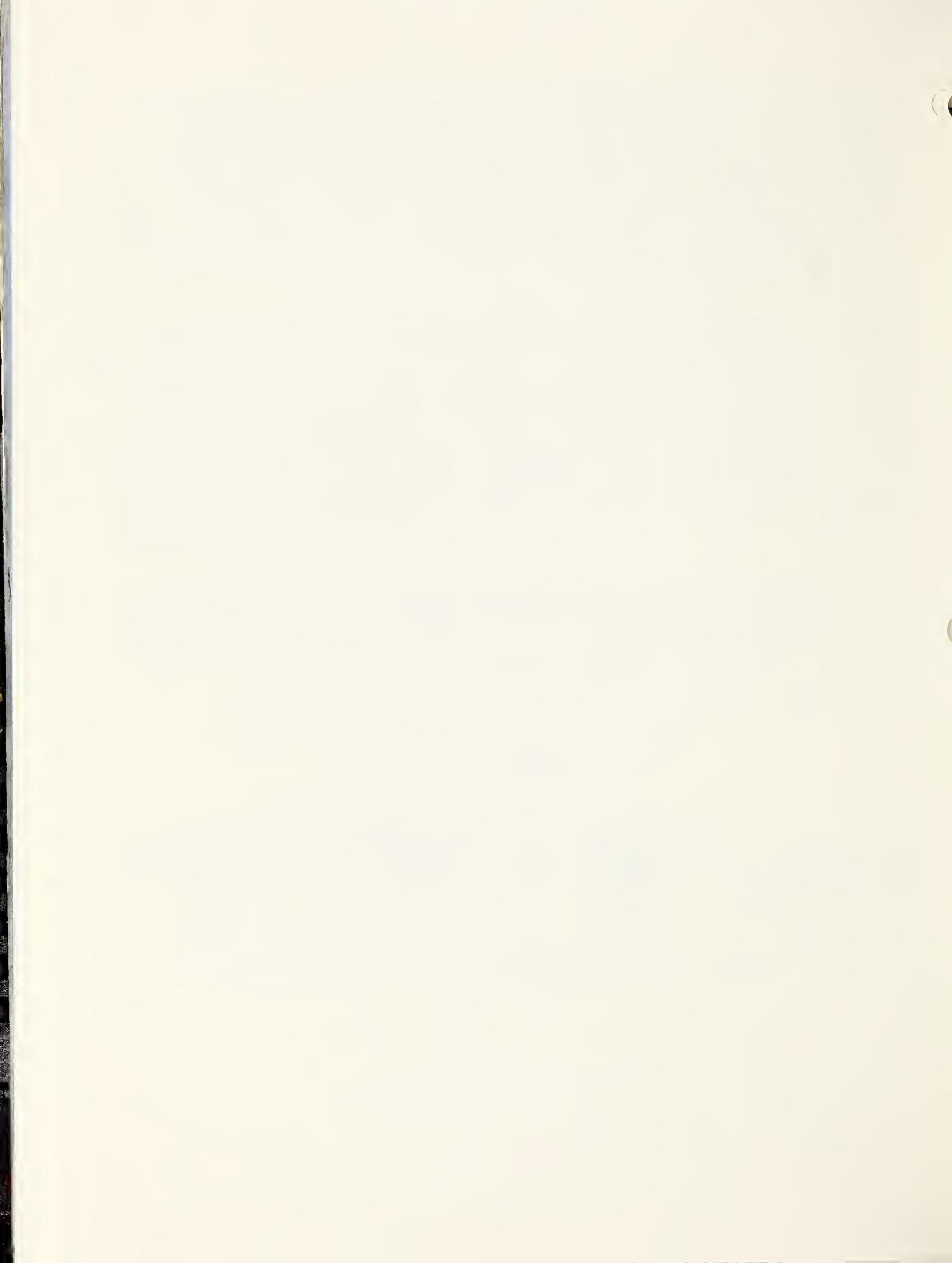
Inspections will be made by the Soil Conservation Service and by the Shuqualak Creek Water Management District on the two floodwater retarding structures and the flood prevention channels. These inspections will be made as frequently as necessary, at least annually, and after unusually severe floods or any other unusual conditions that might adversely affect the structural measures. These inspections will continue for three years following installation of each structural measure. Inspections after the third year will be made annually by the sponsors. They will prepare a report and send a copy to the Soil Conservation Service employee responsible for operation and maintenance and follow-up. Where needed, the Soil Conservation Service employee may continue to provide assistance after the third year as determined by the State Conservationist.

Detailed plans for operation and maintenance will be contained in the Watershed Protection Operation and Maintenance Agreement, which will be executed prior to issuing invitation to bid on construction work. The State Operations and Maintenance Handbook will be used as a guide in preparing the Watershed Protection Operation and Maintenance Agreement.

Project Costs - The project costs are shown in the following table:

Shuqualak Creek Watershed
Cost Data

Item	PL-566	Other	Total
Land Treatment	45,200	164,200	209,400
Structural Measures (Construction)	616,300 (477,700)	172,800 (0)	789,100 (477,700)
Total Project	661,500	337,000	998,500



ENVIRONMENTAL SETTING

Physical Resources - The Shuqualak Creek Watershed consists of a drainage area of 21,610 acres (33.77 square miles). The watershed is located in the east central portion of Mississippi in Noxubee County (98%) and Kemper County (2%). The Town of Shuqualak is located in the approximate center of the watershed (population 600). The watershed is approximately 50 miles north of Meridian, 40 miles south of Columbus, and 100 miles northeast of Jackson. The population of the watershed is rural.

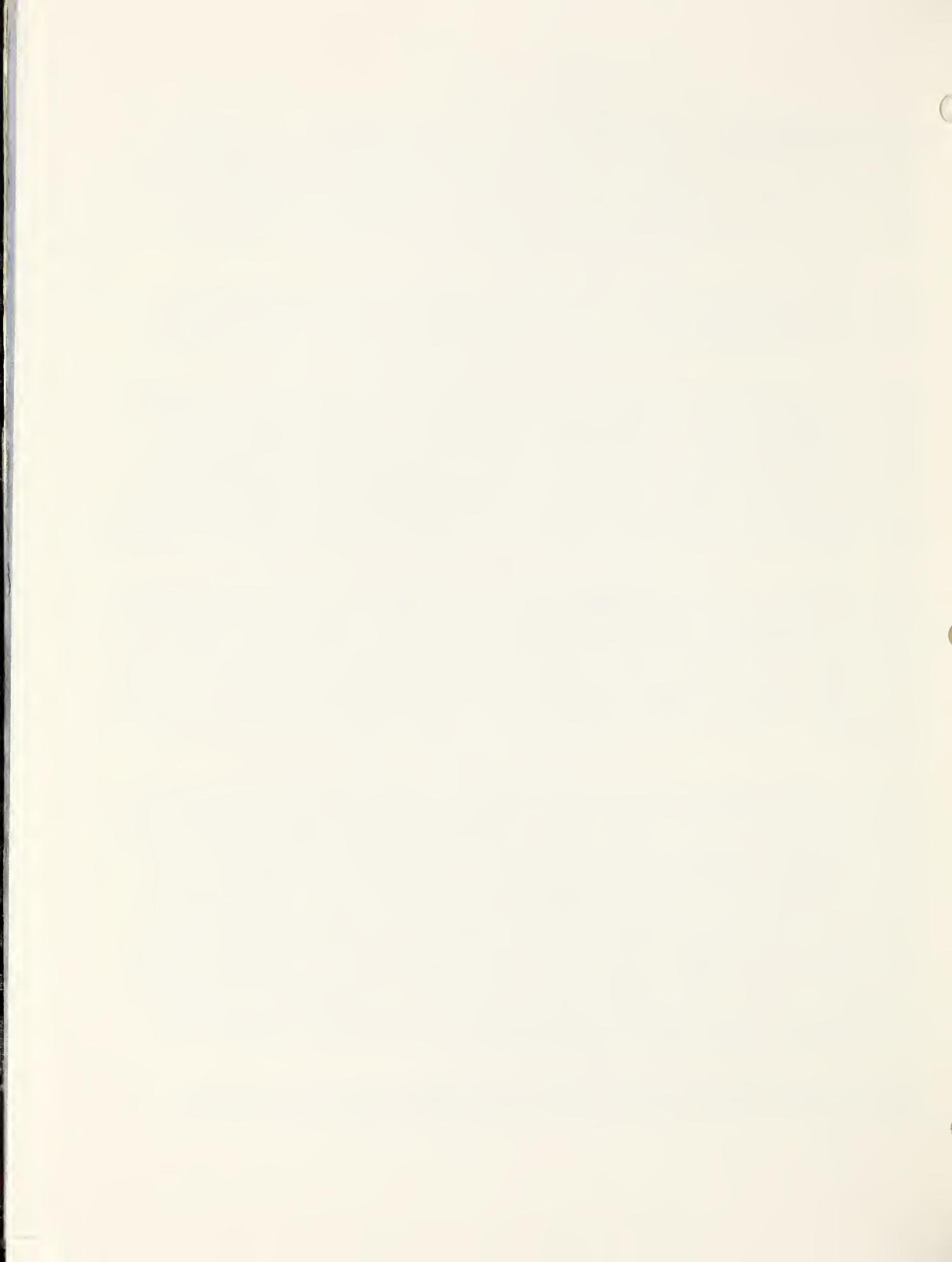
The watershed lies within the Tombigbee River Basin of the South Atlantic Gulf Water Resource Region. The conditions in and the characteristics of this watershed are similar to those of the Coastal Plain and the Blackland Prairie land resource areas in this Resource Region.

There are 6,526 acres of land within the watershed that have an erosion problem and 13,839 acres that have a water problem. Two thousand eight hundred and five acres of the 13,839 acres of land have a flooding problem. The remaining 11,034 acres are classified as having a water problem because of flat slopes and texture of the soil. The 1,245 acres of miscellaneous lands include the Town of Shuqualak and other miscellaneous lands. The lands with an erosion problem are located predominantly in the upland portion of the watershed and the lands with a water problem are located on the terraces and bottom land areas of the watershed.

The flood plain soils are predominantly of the Leeper, Catalpa, and Mantachie series. These soils are somewhat poorly or moderately well drained. Infiltration and permeability rates are moderate to very slow. Natural fertility is moderate. The available water capacity is medium to high. Leeper and Catalpa soils shrink and crack when dry and can be worked only within a limited range of moisture content, whereas the Mantachie soils are fairly easy to work. Good yields can be expected with proper drainage, flood protection, and adequate management.

The principal upland soils of this watershed are in the Interior Flatwoods section of the Southern Coastal Plain and the Blackland Prairie Resource Areas. These soils are Falkner, Ora, Stough, and Wilcox. They range from moderately well to somewhat poorly drained. The clayey Wilcox soils have slow to very slow rates of infiltration and permeability. The Ora and Stough soils are loamy and have a fragipan and the Falkner soils have a silty upper soil and a clayey lower subsoil. The infiltration rate in these soils is moderate to slow, and the permeability above the fragipan or clay layer is moderate, and moderately slow to slow in the fragipan or clay layer. The principal Prairie upland soils are Kipling and Sessums. These clayey soils are somewhat poorly or poorly drained. They shrink and crack when dry. Infiltration is slow and permeability is very slow. The upland soils of this watershed are adapted to locally grown crops, grasses, and pine trees. When properly managed, they produce good yields within their capabilities.

The land capabilities of the watershed consist of 895 acres of Class IIe, 1,485 acres of Class IIIe, 713 acres of Class IVe, 1,753 acres of Class VIe,



and 1,680 acres of Class VIIe lands; 487 acres of Class IIw, 7,095 acres of Class IIIw, and 6,257 acres of Class IVw lands; and 1,245 acres of uncle...fied lands.

The capability classification ^{1/} is a grouping of soils that shows, in a general way, how suitable they are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. In this system all the kinds of soils are grouped at three levels--the capability class, subclass, and unit. The capability classes are designated by Roman numerals I through VIII, the subclasses are indicated by adding a small letter to the class numeral, and the unit is identified by numbers assigned locally. The subclasses indicate major kinds of limitations within the classes and the units indicate management needs. For example, soils in Class II have some limitations that reduce the choice of plants or require moderate conservation practices, while soils in Class III have severe limitations and soils in Class IV have very severe limitations.

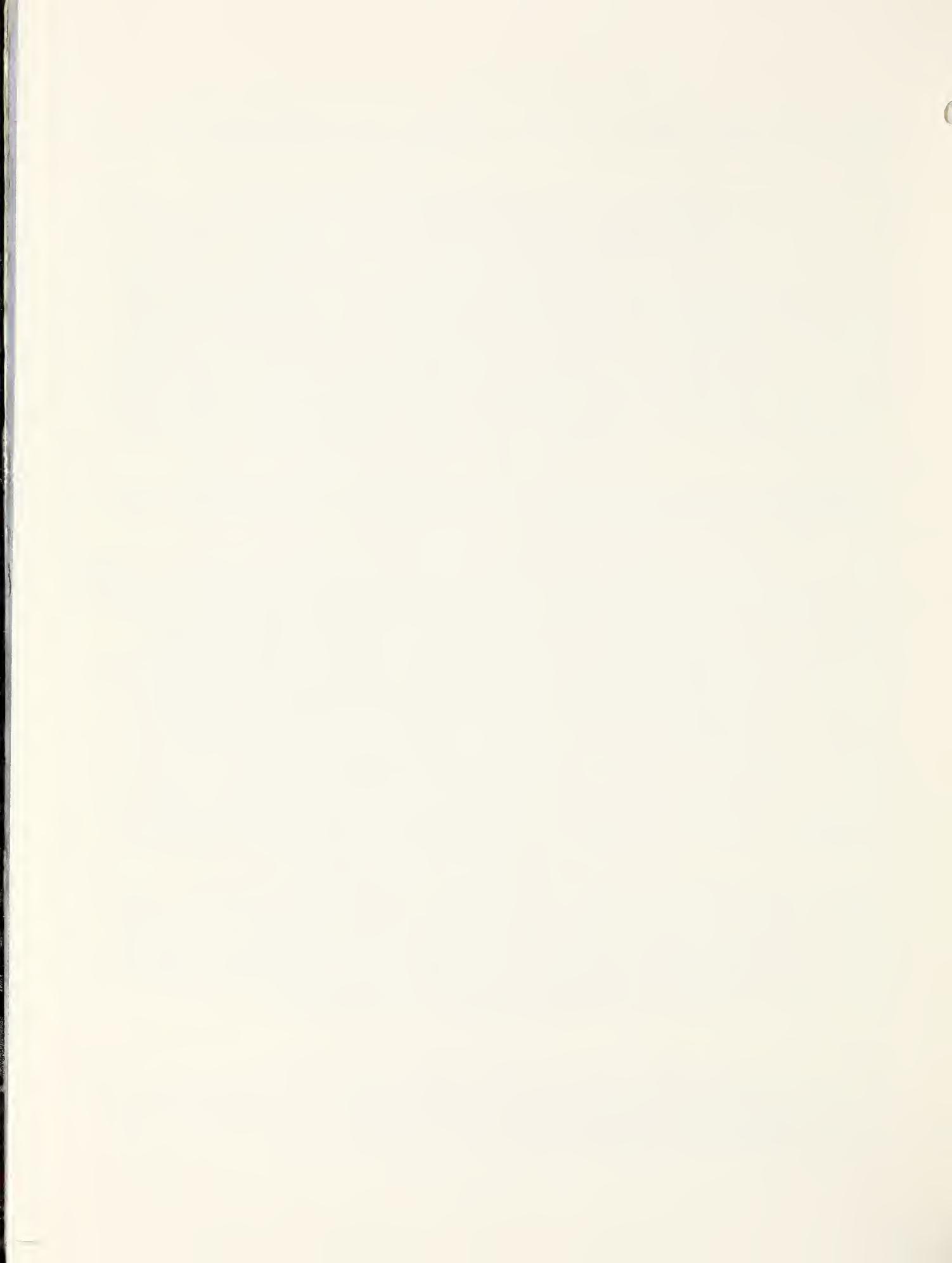
The subclass "e" shows that susceptibility to erosion or past erosion is the dominant problem, and subclass "w" shows that susceptibility to wetness or past wetness is the dominant problem.

The watershed lies within the Southern Coastal Plain Land Resource Area (P-133) and the Alabama and Mississippi Blackland Prairies Land Resource Area (P-135). The topography of the Coastal Plain (which covers approximately the upper one-third of the watershed) is in the form of the Flatwoods Physiographic Region which is formed by the Porters Creek and Clayton formations (both are in the Midway Group-Paleocene). Its principal distinctive topographic feature is the lack of relief, the broad stream valleys being separated by slight swells. The Blackland Prairie (covering the remainder of the watershed) is formed by the Prairie Bluff, Ripley, and Demopolis formations, all of the Selma Group-Upper Cretaceous. This surface is gently rolling, valleys are generally broad and shallow, and the gentle rises which form the divides are almost imperceptible except for an occasional low, rounded knoll. However, the crests of the ridges may be distinguished at some distance by the blackjack and post oak which crown them, or by "bald knobs" formed by the outcropping chalk of these areas from which the mantle has been removed.

The topography ranges from flat in the bottom lands to gently rolling to moderately steep along the southwest edge of the watershed boundary. The Main Shuqualak Creek Valley ranges in width from 1,500 to 3,000 feet. The tributary valleys average about 1,000 to 2,000 feet. The elevation above mean sea level ranges from about 130 feet near the confluence with Noxubee River to about 600 feet along the southwest edge of the watershed. ^{2/}

1/ A Guide to Soil and Water Conservation, Blacklands of the Coastal Plains Resource Area, SCS, 1961.

2/ U. S. Geological Survey, Gholson Quadrangle 1962 and Field Surveys, SCS.



The climate is generally temperate and humid with mean monthly temperatures ranging from 47.0 degrees Fahrenheit in January to 82.3 degrees in July, and the mean annual is 64.0 degrees. The normal growing season is 230 days and during this period, the average rainfall amounts to 31.72 inches. The ~~aver~~^{1/} annual rainfall is 53.06 inches and ranges from 3.11 inches in September to 6.01 inches in March. 1/

Mineral resources in Noxubee County consist of limestone, clay, sand, gravel, and small amounts of bauxite. The mining activities of these resources are confined to areas outside the watershed boundary.

Water from wells furnishes the water supply for the watershed and surrounding area for both domestic and industrial needs. The source of water supply for the Town of Shuqualak is from one drilled well and one emergency well with an average daily pumpage of about 54,000 gallons, and, although not treated, the water has a high content of dissolved solids. 2/ Livestock water is obtained from farm ponds and wells.

The current land use of the watershed is about 4,241 acres of cropland (20 percent), 2,215 acres of grassland (10 percent), 11,743 acres of forest land (54 percent), 2,166 acres of other land (10 percent), and 1,245 acres of miscellaneous land (6 percent). The other lands are mostly idle land that are available for agricultural use and wildlife lands. The miscellaneous lands consist of roads, house sites, railroads, water areas, etc.

There are 6,526 acres in the erosion-problem area of which 11 percent is in cropland, 34 percent in grassland, 47 percent in forest land, and 8 percent in other lands. There are 13,839 acres with a water problem of which 24 percent is in cropland, 8 percent in grassland, 61 percent in forest land, and 7 percent in other lands. Land use of the 2,805 acres of flood plain is 27 percent cropland, 45 percent grassland, 24 percent forest land, and 4 percent in other lands. This 2,805 acres is included in the 13,839 acres of land with a water problem.

Shuqualak Creek heads up about six miles southwest of the Town of Shuqualak and flows in an easterly direction to its confluence with Noxubee River. It has two major tributaries that enter from the north--one just south of town near U. S. Highway No. 45 and one near Station 200+00 (see Project Map).

Main Shuqualak Creek begins as a natural channel and flows through forest land in the immediate overbank area to about one-half mile upstream from the Illinois Central and Gulf Railroad; thence, in a man-made channel through cultivated land to Station 278+00 (see Project Map); thence, in a well-defined modified channel through forest land in the immediate overbank area to its confluence with Noxubee River.

1/ U. S. Geological Survey, "Climatological Data" Mississippi.

2/ J. W. Lang and E. H. Boswell. Public and Industrial Water Supplies in a Part of Northern Mississippi, Bulletin 90, Mississippi Geological Survey, University, Mississippi, 1960.



Tributary No. 2 begins as a well-defined natural channel and flows south-easterly through forest land in the immediate overbank area to about one mile west of the Illinois Central and Gulf Railroad; thence, in a man-made channel through cultivated land to its confluence with Main Shuqualak Creek. The tributaries forming Channel No. 3 are predominantly man-made or modified channels and flow through mostly open land except for a small portion of forest land in the immediate overbank area about one mile upstream from its junction with Shuqualak Creek.

Main Shuqualak Creek starts with a natural depression forming a parabolic or rectangular-shaped channel as flow accumulates downstream to the Noxubee River. The channel starts with a small cross sectional area and increases to about 200 square feet near the Illinois Central and Gulf Railroad with a discharge capacity of about 725 cubic feet per second of water. The reach from the railroad through U. S. Highway 45 decreases in area and capacity to 120 square feet and 400 CFS, respectively. From U. S. Highway 45 to Station 200+00 the area and capacity increase to 350 square feet and 930 CFS, respectively. The larger cross sectional area and carrying capacity in the middle reaches are due to a better maintained man-made channel through the more intensively farmed part of the watershed. From Station 200+00 the area and capacity of the channel decrease to about 200 square feet and 350 CFS, respectively. This decrease is due to the termination of the man-made channel at Station 278+00 and flow reentering a well-defined slightly modified meandering channel through forest land in the immediate overbank area to Noxubee River.

The channel from the upper part of the watershed to the Illinois Central and Gulf Railroad is through forest in the immediate overbank area and has woody vegetation adjacent to and within the channel banks and is aggrading slightly. From the railroad to Station 278+00 the channel is through open farmland and has vegetation (grass and weeds) on and inside the channel banks. This reach is relatively stable.

From Station 278+00 to Noxubee River the channel reenters forest land in the immediate overbank area. The banks and the inside of the channel both are covered with grass, weeds, bushes, and trees. Due to excessive meander there is some periodic change in the channel banks, otherwise the channel is still relatively stable.

The ephemeral flow permits vegetation to establish in the channel during the growing season.

All of the tributary channels are parabolic in shape, range from 0 to 400 square feet in area, range from 0 to 600 in CFS in capacity, are covered in vegetation (grass and woody), and are slightly aggrading.

All channels are ephemeral since they sustain flow only during and immediately after periods of rainfall. Surface water resources are confined to small lakes and farm ponds.

Plant and Animal Resources (Flora and Fauna) - Fifty-four percent of the watershed is in forest cover which occurs as large continuous tracts in the upland portion of the watershed. Species composition of these upland forests is primarily good quality loblolly pine. Approximately 750 acres of hard-

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wood forest are located in the bottom land at the extreme east end of the watershed. About 360 acres of this bottom land is within the Shuqualak Creek flood plain. Species composition in this bottomland forest is red oak, p. oak, hickory, elm, and sweet gum. This area was cut over approximately 40 years ago. The resulting timber stands are well stocked with hardwood pole timber, mostly of oak-hickory type. The general hydrologic condition of the hardwood forest soils is good.

The loss of forest to fire has been fairly low with an average percent burn for the years 1966 through 1971 of 0.13. This exceeds the Mississippi fire loss index goal of 0.25 percent and the watershed protection goal of 0.20 percent.

Sixty-one percent, or 7,137 acres, of the forest land within the watershed is owned by industries. This land is under intensive forest management for pulp-wood and sawtimber. These forest soils are generally in good hydrologic condition. Since there are only 720 acres of forest land in the flood plain area, most of the forest industries lands are in the non-flood areas.

One percent, or 150 acres, of the forest land within the watershed is owned by the U. S. Navy, Department of Defense, and is managed under the guidelines of a multiple-use forest management plan prepared by the Noxubee County Management Forester of the Mississippi Forestry Commission in cooperation with the U. S. Navy.

There are about 125 acres (1 percent) of forest land in sixteenth section state-owned lands. These acres are now being leased by private individuals and are managed by them. Since these lands are in the vicinity of Shuqualak, which is also on sixteenth section lands, they are considered as available for the town's expansion.

Thirty-seven percent, or 4,331 acres, of forest land in the watershed is privately owned by small landowners. Eighty percent of this forest land within the watershed is under multiple-use land management. The remaining small land-owner forest resource does not receive professional management; however, it is in very good silvicultural and hydrologic condition.

The dominant species on the grasslands consist of common bermudagrass, Johnson-grass, Dallisgrass, and common lespedeza. The dominant species of crops grown in the area are cotton, corn, and soybeans.

The quality and quantity of wildlife habitat resources within the watershed vary from low to high. The bottomland hardwoods, and to a lesser extent the mixed upland forest, provide high-quality habitat for deer, turkey, squirrel, raccoon, and other wildlife species. The intensively farmed cropland and pastureland provide moderate habitat for farm game species such as rabbit, dove, and quail. The flood plains which consist primarily of pastureland and cropland are classified as being low in forest-type wildlife. The channel banks from U. S. Highway 45 to Station 406+00 and an area of steep, badly eroded lands on the south rim of the watershed are low in wildlife habitat because of frequent spraying of the channel banks to control woody vegetation and lime outcropping in the badly eroded land.

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The upper reaches of tributary channels and adjacent uplands have limited wildlife habitat.

Below Station 406+00 to the confluence of the Noxubee River, wildlife habitat along the channel banks and on both the bottomland and upland range from moderate to high. The meandering course of the existing channels has numerous idle areas and food and cover plants scattered along the streams that provide a source of food for upland wildlife species and habitat for species dependent upon an aquatic ecosystem. Much of the area along the existing channel provides a diversity of cover and food for wildlife which breaks the pattern of the large fields. Blocks of hardwood timber, ranging from less than one acre in size to one area of over 700 acres at the junction of Shuqualak Creek with the Noxubee River, provide excellent habitat for deer, turkey, squirrel, raccoon, and other species (including mink and muskrat) indigenous to bottomland hardwoods. Abandoned fields and mixed stands of timber, along with the meandering channel and associated vegetation, make this a much more productive area for wildlife species.

Occasional flooding from Shuqualak Creek provides some beneficial effects in that additional nutrients are deposited in the stream and on floodplain soils. The resulting increased fertility has a positive effect on growth and production of organisms inhabiting the stream and floodplain ecosystems. Some waterfowl use the floodplain, especially soybean fields and hardwood timber when flooding does occur during winter months. Overbank flooding also increases the available foraging area for fish.

There are no permanent water areas of significance in the watershed other than farm ponds and small lakes and small beaver ponds. Fishery resources are limited to these small ponds and lakes and to isolated deep holes in Shuqualak Creek adjacent to the Noxubee River. Much of the upper reaches of the channel is a dry bed during summer and fall; however, the farm ponds and lakes provide an adequate water supply for upland wildlife species. The Noxubee River does provide excellent habitat for fishery resources and associated aquatic organisms. Potential impoundment sites are comprised primarily of pasture and cropland with about 37 acres being in forest lands.

The 37 acres of woods will be cleared in conjunction with structure no. 1. The majority of this forested area is large mixed oak and hickory with scattered sweet gum and sugarberry. This tract of hardwoods provides excellent habitat for forest game species. The primary browse is Japanese honeysuckle of which there is an abundance. The remainder of the flood and sediment pool is in row crops (cotton) and presently offers little wildlife food or cover; however, the border between the woods and the fields provides good quail and rabbit habitat.

The major tributary of this structure is natural with ephemeral flow. There is one beaver pond within the proposed impoundment and it does not impound water outside the present channel, therefore provides little or no waterfowl habitat.

The majority of the sediment pool of structure no. 2 is in improved pasture which is heavily grazed and of poor value to most game species. The stream to be impounded has been channelized and has varying amounts of woody vegetation. A strip varying from 30 to 70 feet in width associated with the stream provides the areas only cover for wildlife. The primary tree species along the channel are willow, sweetgum, sugarberry, and various oaks, all of which are young to

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medium aged. Japanese honeysuckle occurs frequently among the hardwood providing additional cover. The channel is stair-stepped with a series of small beaver ponds. Only one, however, impounds water outside the present creek channel. This pond is small (approximately three acres) and is located near the upper end of the sediment pool. The timber within and around this impoundment consist of willows which are presently too small to contain suitable cavities for wood duck nesting. It is possible, however, that wood ducks could hatch in existing timber near the pond and move to the impoundment to rear their young. The impoundment probably supports a small sport fishery and provides some wintering and breeding habitat to waterfowl.

The beaver ponds described in the preceding two paragraphs have a total surface area of about five acres and are classified as Type 4 and Type 6 wetlands as outlined in the U. S. Department of the Interior, Fish and Wildlife, Circular 39, "Wetlands of the United States". Also, the 360 acres of floodplain with hardwood forest in the extreme eastern and lower end of the Shuqualak Creek is classified as Type I wetland because of occasional flooding from both Shuqualak Creek and Noxubee River. In addition, one-half of the remaining Shuqualak Creek floodplain, which floods on the average of twice per year, is classified as Type I wetland even though the flooding is of very short duration, usually less than 24 hours. This acreage amounts to about 435 acres.

Public access in the watershed is limited since most of the land and water areas are posted by landowners and/or leased to hunting clubs.

Upland wildlife populations within the watershed are dependent on food and cover furnished by both native vegetation and agricultural crops (soybeans, corn, forest land, etc.). The highest quail and rabbit populations are present in those areas of the watershed where small blocks of forest land, brush, and idle land are in the proper distribution with cropland. The best quail habitat occurs along the lower portion of the channel. Squirrel are indigenous to the forested habitat of the watershed. Deer are probably the most economically important game species with the heaviest populations occurring in the heavily forested areas. Dove are numerous with good populations occurring on the soybean fields after harvest. Turkey are restricted to the larger and more isolated forested areas. Waterfowl are dependent on flooding of the floodplain lands for temporary resting and feeding areas.

There are no known or reported rare or endangered species in the watershed. However, there have been sightings of the red-cockaded woodpecker within a 30-mile radius of the watershed and there are large tracts of primarily pine forest land in the upper reaches of the watershed that may now or in the future provide suitable habitat for the red-cockaded woodpecker.

Economic Resources - Land ownership is private except for 730 acres of Sixteenth Section School Lands, which are owned by the State of Mississippi and administered by the Noxubee County Board of Supervisors and 210 acres owned and managed by the U. S. Navy, Department of Defense.

The major type of farm enterprise is livestock-row crop. There are 50 farms or parts of farms in the watershed with an average size of about 450 acres. Family-type farms are scattered throughout the watershed and floodplain.

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Dominant crops and yields per acre now grown on soils in the upland portion of the watershed are soybeans (24 bu.), cotton (600 lbs.), corn (50 bu.), and hay (1.0 ton). Pastureland yields average about 5 A.U.M. (animal unit months per acre per year. The dominant crops and present yields per acre grown in the flood plain area are soybeans (30 bu.), cotton (700 lbs.), corn (65 bu.), and hay (1.5 tons). Flood plain pastures yield about 6 A.U.M. per acre per year.

Current agricultural land values in the watershed for both upland and bottom land will average about \$175 per acre, exclusive of the Town of Shuqualak. The value of the land in the Town of Shuqualak is about \$2,000 per acre.

The county roads, State Highways Nos. 21 and 39, U. S. Highway No. 45, and the Illinois Central and Gulf Railroad provide easy access to nearby business areas and markets.

Shuqualak, with a population of about 600, is the only town in the watershed. A sawmill, planer mill, pulpwood yard, brick kiln, glove manufacturing plant, a general construction company, and local merchants of Shuqualak and the nearby U. S. Navy auxiliary landing strip provide some off-farm employment to local watershed residents. Underemployment levels are high. The level of income is low. In 1969 the gross value of all farm products sold averaged about \$10,350 per farm. The net return would be much less due to the high cost of production. The population has been on a decline since World War II but has begun to level off. The following information¹ gives some indication of the economic climate in the watershed area.

<u>Item</u>	<u>Unit</u>	<u>Kemper Co.</u>	<u>Noxubee Co.</u>	<u>National</u>
Unemployment	Percent (1970)	8.3	9.6	4.4
Families with income below low level	Percent (1969)	48.6	47.5	10.7
Median family income	Dollars	3,414	3,891	9,586
Per capita income	Dollars (1969)	1,138	1,307	3,119
Lacking some or all plumbing facilities	Percent (1970)	47.5	51.4	5.5
Population over 25 with less than 5 years of school	Percent (1970)	21.2	23.5	5.5

The watershed is located in the Tombigbee River Valley Water Management District, Appalachia Region, Northeast Mississippi Resource Conservation and Development Project, the Golden-Triangle Planning and Development District, and in the area served by Economic Development Administration Assistance.

The income from privately owned forests contributes significantly to the local economy. There is a large sawmill in the watershed which provides a ready market for forest products and the trapping of mink, muskrat, raccoon, and beaver have been reported from both the Shuqualak Creek and the Noxubee River areas.

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Recreational Resources - Recreation resources in the watershed are limited to privately owned ponds and small lakes, Noxubee River, and hunting on privately owned lands. Additional recreational resources are available at Lake Ona-ee (about 3,800 acres) located about 35 miles southwest of the watershed and at Bluff Lake (about 1,000 acres) located about 25 miles northwest of the watershed.

Archeological and Historical Resources - The National Register of Historical Places, dated February 4, 1975, and monthly supplemental, dated February 28, March 11, April 1, May 6, June 3, July 1, and August 5, 1975, were consulted and there were no listed historical sites in the watershed. The Department of Archives and History, State of Mississippi, authorized an archeological survey of the watershed. This survey was accomplished by Professor Richard A. Marshall and some of his students at Mississippi State University on April 7-8, 1971. The report on the survey revealed that eight ancient camp sites and two villages had existed in the watershed. Four of the sites' ages were unknown but the others range in age from 2000 B.C. to A.D. 1800. Some were listed as having Choctaw culture but most of them had no cultural indication. The report stated that the project would not damage eight of the sites but that spoil might be spread on two of the sites. The report stated that this would not be a serious loss. The Planning Staff studied the location of these two sites and found that no structural works are planned adjacent to these areas. The only recommendations were that when members of the Department of Archives and History were in the area, they should check for more material as evidence.

There is a very scenic view from White House Mountain (elevation 600 feet) along the southwest rim of the watershed looking to the north and east over the Shuqualak Creek and the Noxubee River Basin with the Town of Macon rising on the northern horizon. The scenery has high visual quality during the fall months with the foliage giving much color to the scene.

Soil, Water, and Plant Management Status - Some lands in the upland area formerly in cultivation are being established to grassland. The flood plain lands of the watershed are rich productive soils. Crops and pasture grasses grow well on these type soils. Row crops are grown extensively in the flood plain.

The land treatment and land use program in the watershed is good. Its uses and treatments are very closely related to the land use capability classes. The factors of production (land, labor, and capital) are employed rather efficiently on the uplands, but are inefficiently used on the more severely flooded areas along the lower one-half of Shuqualak Creek.

The Kemper and Noxubee Counties Soil and Water Conservation Districts were organized in 1938 and 1941, respectively. The Districts have an active program in the watershed with 41 of the 50 farms having conservation plans, with 80 percent of the present plan measures established. These conservation plans cover 80 percent of the watershed. Soil surveys have been completed for the entire watershed.

Land management needs within the watershed are limited primarily to improvement of soil-water-air relationships as they apply to plant growth. Excess water on the land and within the soil profile retards plant growth, delays planting,

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cultivation, and harvesting, contributes to competition from weeds, and encourages insects and disease. Available capital for financing on-farm drainage measures is expected to be adequate in most instances.

The forest lands owned by the U.S. Navy are managed under guidelines of the multiple-use forest management plan prepared by the Noxubee County Management Forester of the Mississippi Forestry Commission. The U.S. Navy has a professional forester employed to manage the forested buffer zone.

The Management Forester of the Mississippi Forestry Commission through co-operation with private landowners has written 38 forest management plans on private forest land within the watershed. Eighty percent of the private forest land within the watershed is under multiple-use land management.

Forty acres of understocked private forest land was planted to loblolly pine, and forest stand improvement was carried out on 400 acres during the last 10 years. This treatment was carried out through cooperation of the Management Forester, private landowners, and the Rural Environmental Assistance Program.

Fire protection is provided by the Mississippi Forestry Commission in cooperation with the U.S. Forest Service through the Clark-McNary Cooperative Fire Control Program. Other Federal-State cooperative forestry programs being utilized include Cooperative Forest Management, Cooperative Reforestation, General Forestry Assistance, and Cooperative Insect and Disease Control.



WATER AND RELATED LAND RESOURCE PROBLEMS

Land and Water Management - Sheet erosion is moderate on the open upland areas in the watershed, is more severe on the cultivated row crop areas, and is less severe on the permanent pastures and grasslands. The upland soils are usually productive when commercial fertilizers are incorporated with good management practices. Soil moisture is generally sufficient for crops and grasses. There are about 167 acres of Capability Class VIe land now in cultivation which needs to be converted to close-growing vegetation. There are about 260 acres of Classes IIe and IIIe lands that are now growing feed crops such as corn and sorghums; these crops should be moved to the flood plain when the flooding problem is reduced. In Reach 1 of the Shuqualak Creek flood plain, only 17 percent is now in crops because of the flooding problem. The 51 percent now in pastures has been taken out of cultivation because of the flooding problem.

The production factors are presently more efficiently used in the uplands than in the flood plain due to the severe flooding problems of the bottom lands.

According to the U. S. Forest Service, two special problem areas are located in the forest land at the extreme southwest end of the watershed. One small area contributes about 300 tons of sediment annually into the upper channel system. Another area, about 50 acres in size, was cleared and planted to loblolly pine in 1971. Erosion is still occurring on this area with some sediment going into the upper channel system. However, with the help of the debris remaining on the ground, the natural revegetation, and the planted tree seedlings, stabilization should occur within one more growing season.

Floodwater Damage - Frequent flooding occurs on bottom land soils adjacent to Shuqualak Creek and its tributaries. Areas affected vary in width from a few hundred feet on the small tributaries to about 3,000 feet in width on Reach 1 of Shuqualak Creek. The flood plain is used mainly for agriculture with about 72 percent open land and 24 percent forest, and 4 percent other land. Almost all of the 72 percent open land was formerly cultivated. Damages to on-farm improvements are extensive as well as to public roads and bridges. There are approximately 23 farms or parts of farms located in the flood hazard area.

Approximately 2,805 acres of land within the watershed are inundated by the 100-year frequency storm, 2,263 acres by the 5-year frequency storm, and 1,861 acres by the 1-year frequency storm.

Damages include reduced crop and pasture yields, increased crop production costs, and increased maintenance expenses on flood plain improvement. Crop damages are particularly severe in Reach 1. Constraints to flood plain land use and crop production are a major problem in the watershed. Agricultural damages in Reach 2 of Shuqualak Creek are less extensive than in Reach 1 because of smaller peak discharges and shallower depths of flooding.

Nonagricultural damages are reflected as increased costs for road and bridge maintenance.

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Agricultural damages from floodwater are significant along Shuqualak Creek. The most severe damages occur from about the middle of the flood plain downstream. Damaging floods occur on an average of four times per year with about two floods occurring during the crop-growing season of April through October. In Reach 1, corn, soybeans, and hay occupy about 17 percent of the flood plain; pasture, 51 percent; and forest and other, 32 percent. In Reach 2, about 38 percent of the flood plain is in cotton, 27 percent in corn, 10 percent in soybeans, 17 percent in pasture, and only 8 percent in scattered small patches of forest land and other land. The table below shows the breakdown of open and forested land by reaches and sub-reaches.

Reach	Open		Forested		Total
	Acres	Percent	Acres	Percent	
E-1	:	:	:	:	:
Sub E-1 Sta 406+00 to 544+55	: 1426	: 68.0	: 671	: 32.0	: 2097
Sub E-1 Sta 278+00 to 406+00	: (15)	: 4.00	: (361)	: 96.0	: (376)
Sub E-1 Sta 166+50 to 278+00	: (416)	: 70.0	: (178)	: 30.0	: (594)
	: (995)	: 88.3	: (132)	: 11.7	: (1127)
E-2	:	:	:	:	:
	: 353	: 92.2	: 30	: 7.8	: 383
E-3 (uncontrolled reach)	:	:	:	:	:
	: 306	: 44.0	: 19	: 6.0	: 325
Total	:	:	:	:	:
	: 2085	: 74.3	: 720	: 25.7	: 2805

The most rainfall occurs in the late winter and early spring and causes flooding damages during planting time. However, frequent storms of long duration occur in the late summer causing considerable flooding damage to maturing crops.

On August 25, 1967, a storm occurred that produced 5.90 inches of rainfall. This storm was equivalent to the 5-year, 24-hour frequency event and flooded about 2,263 acres causing \$18,200 of agricultural damage under 1967 conditions in the flood plain.

About 90 percent of all average annual damages are received from storms which occur more frequent than the 5-year frequency and about 50 percent of all average annual damages are received from storms which occur more often than the 1-year frequency.

Reach 1 is from Station 544+55 (Noxubee River) to Station 166+50 (see Project Map) and contains approximately 2,097 acres. The flood plain in this reach is nearly 3,000 feet in width and floods to a depth of 6 feet when the 100-year frequency storm occurs.

Reach 2 is from Station 166+50 upstream to proposed Floodwater Retarding Structures Nos. 1 and 2. It contains approximately 383 acres, varies in width from 800 to 2,000 feet, and floods to a depth of approximately 3 feet when the 100-year frequency storm occurs.



Reach 3 is identified as the flood plain lands upstream on the tributaries that make up Channel No. 3. This area contains approximately 325 acres and floods to a depth of about 3 feet when the 100-year frequency storm occurs.

Average annual floodwater damages are estimated to be \$56,000 to crops and pastures, \$31,800 to other agricultural, \$13,700 to roads and bridges, and \$11,600 to indirect damages. The average annual crop and pasture damage includes the loss of net income from lands that have been converted to less intense agricultural use because of flood hazards.

The depth, duration, and frequency of flooding increase the possibility of domesticated animals and wildlife drowning by being isolated on island-like areas. The decaying animals and the increased vector problem due to long durations of flooding contribute to the health hazard of people living in the immediate area adjacent to Reach 1. Since there is no one living in the flood-prone areas, there is little probability of loss of human lives.

The inundation of graveled county roads in Reach 1 causes frequent inconvenience to local travel, U. S. mail service, and transportation of school children.

Erosion Damage - Average annual sheet erosion rates for upland by land use are: Cropland (3281 acres), 30.2 tons per acre; pastureland (2219 acres), 5.9 tons per acre; forest land (10,836 acres), 4.3 tons per acre; and other land (1,379 acres), 6.9 tons per acre. Annual gully erosion rates vary from 50 to 100 tons per acre. One isolated area produces approximately 300 tons per acre. The gross erosion rate watershed-wide averages about 8.2 tons per acre per year.

Gully erosion occurs primarily in three areas of the watershed. The first is on a few isolated "bald" spots (Cretaceous chalk outcrops) in pasturelands along the eastern half of the southern rim of the watershed. This erosion has been reduced from what it was in the past by land treatment and good management practices by the landowners. The second includes an area of approximately 50 acres in the upper reaches (southwestern corner) of the watershed that was cleared and a part of it was used as borrow area. This area has been planted to pines. The third area of gully erosion is in one small area (approximately one acre) that has been used as borrow. Erosion at this area is approximately 300 tons per acre per year. This area has been treated but needs additional treatment. Generally, the above-mentioned erosion has not been a serious problem to agricultural production.

Sediment Damage - Sediment deposition on agricultural lands in the flood plain is no longer a problem in the watershed. Some deposition has taken place in the past. Much of this was in the form of fine-grain Cretaceous-age material from the eastern half of the southern rim of the watershed. It has caused filling farm ditches and laterals crossing the flood plain. Sediment deposition has not been permanently detrimental to the agricultural lands on which it has been deposited. Land treatment and good management have greatly reduced the problem of sedimentation through the reduction in cultivation of upland soil and conversion to pastures and forest and treatment of the remaining upland cultivation, pastures, and forest for runoff and erosion control.

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The present average annual sediment yield at the mouth of the watershed amounts to 51,000 tons or approximately 1,158 milligrams per liter.

Drainage Problems - There are 11,034 acres that have a drainage problem. The major water problem on these lands is due to internal drainage which is limited by the flat slopes and the texture of the soil. This has caused row crops to be poor in quality, have high production costs, and produce marginal yields. Therefore, the trend to offset this has been from row crops to pasture and forest on these 11,034 acres.

Irrigation Problems - There are no irrigation systems in the watershed and none are planned or anticipated.

Municipal and Industrial Problems - The present municipal, industrial, and domestic water supply for the Town of Shuqualak is obtained from existing wells with an average daily pumppage of about 54,000 gallons and is adequate for present needs. Although not treated, the water has a high content of dissolved solids. ^{1/} The population of the area has varied little in the past five years and has about leveled off. The rural population obtains its domestic water supply from individual wells. Due to the sparse population, a central water supply system would not be feasible.

According to the Noxubee County Development Plan OEDP, existing water supply is adequate for present and future needs.

Recreation Problems - Outdoor recreation in the watershed area is limited to privately owned small ponds and lakes, the Noxubee River, and privately owned lands. Water-based recreational facilities are available at Lake Okatibbee which is located approximately 35 miles southwest of the watershed. Lake fishing is available at Bluff Lake which is located approximately 25 miles northwest of the watershed.

Plant and Animal Resource Problems - Changed land use, erosion, and sediment deposition are causing no measurable damages to fish and wildlife resources under present watershed conditions.

Summer flooding no doubt causes some mortality of rabbits and ground nesting birds. However, the flooding which occurs during the winter and early spring causes no significant losses to wildlife populations.

Water Quality Problems - The channels become streams only during periods of high storm runoff. Therefore, they have been classified as drainage by the Air and Water Pollution Control Commission. Turbidity caused by erosion and sedimentation is the major water quality problem in the watershed.

Economic-Social Problems - Approximately 60 percent of all farms had farm income from the sale of farm products of less than \$2,500 in 1969. In 1964, 56 percent of all commercial farms had incomes of less than \$2,500 and in 1969, 30 percent had incomes of less than \$2,500. The average gross income per farm from the sale of farm products increased from \$3,142 to \$4,358 (39 percent) from 1959 to 1964 and from \$4,358 to \$10,349 (237 percent) from 1964 to 1969, while the number of farms declined 9 percent and 42 percent per period, respectively.

^{1/} J. W. Lang and E. H. Boswell, Public and Industrial Water Supplies in a Part of Northern Mississippi, Bulletin 90, Mississippi Geological Survey, University, Mississippi, 1960.



The following table shows farms for Noxubee County by farm income groups which is considered to be representative of the watershed:

	Noxubee County *		
	1959	1964	1969
Total Farms	2,037	1,748	1,013
Farms by Economic Class:			
Commercial Farms	1,101	1,167	569
Class I, \$40,000 or more	8	18	51
Class II, \$20,000 - \$39,999	41	45	83
Class III, \$10,000 - \$19,999	59	76	69
Class IV, \$5,000 - \$9,999	103	118	53
Class V, \$2,500 - \$4,999	169	254	146
Class VI, \$50 - \$2,499	721	656	167
Other Farms	936	581	444
Part-Time	575	278	233
Part-Retirement	360	303	210
Abnormal	1	0	1
Percent Total Farms Less than \$2,500 Income	81	71	60
Percent Commercial Farms Less than \$2,500 Income	65	56	30
Value of All Farm Products Sold (Average Per Farm)	\$3,142	\$4,358	\$10,349
Percent Increase in Sale of Farm Products	39	237	

* U. S. Census of Agriculture of Mississippi.

The watershed is an economically depressed area and its residents are eligible for assistance under the Area Redevelopment Act, Appalachia Program, and Economic Development Assistance.

There is a need for additional employment opportunities in the watershed and in Noxubee County. The following estimated unemployment statistics by the Mississippi Employment Security Commission for Noxubee County are considered representative of the area:

Period	Total Employment	Unemployed	
		Number	Rate
1940	8,895	582	6.6
1950	6,624	398	6.0
1960	6,375	544	8.5
1962	5,416	461	8.5
1963	5,191	399	7.7
1964	5,355	633	11.8
1965	4,974	236	4.7
1966	4,880	240	4.9
1967	4,710	200	4.2
1968	4,700	240	5.1
1969	4,510	190	4.2
1970	4,570	260	5.7
1971	4,550	280	6.2



The estimate of the work force shows a steady decline from 1962 (5,416) through 1969 (4,510) and seems to have leveled off during 1970 (4,570) and 1971 (4,570). The estimated unemployment rates ranged from a high of 11.8 percent in 1964 to a low of 4.2 percent in 1969 but had increased to 6.2 percent in 1971. However, many of the employed as well as the unemployed have substandard incomes, reflecting partial underemployment. Many who are considered as employed in agriculture are actually underemployed, due to the fact that agricultural work is seasonal. If other employment were available, agricultural operations as well as other work could be carried on profitably.

The farms which employ one and one-half man-years or more of hired labor are in a minority and their operations comprise less than 50 percent of the benefited area as compared to the family-type farm operation. The economic and social aspects of these farm families could be enhanced by effective guidance in promoting rural community development.

ENVIRONMENTAL IMPACTS

Flood Prevention, Erosion, and Sediment

The combined effects of the proposed works of improvement are illustrated by the changes from without project to with project in peak discharges, acres flooded, and depth of flooding for selected frequencies at significant locations as shown in the table on the following page.

The two floodwater retarding structures alone provide agricultural protection in Reach 2 (see Project Map) from the five-year frequency storm.

The combined project of land treatment, floodwater retarding structures, and channel work will accomplish an 80 percent reduction in acres flooded by the 2-year, 24-hour frequency storm in the reach extending from Station 166+50 downstream to Station 406+00. This degree of protection will enable this flood plain land to sustain continuous high value row crop production.

The flood plain area of Reach 1 from Station 406+00 downstream to the Noxubee River is through an area that is utilized predominantly for timber production and wildlife habitat. There is no channel work planned for this area, and the only flood protection afforded is the small amount of reduction in flooding that is brought about by land treatment and Floodwater Retarding Structures Nos. 1 and 2. Flooding will occur in this reach on the average of about three times per year under project conditions.

This project, when installed, will have beneficial effects downstream on the Noxubee River by reducing the 100-year peak discharge (16 percent), acres flooded (28 percent), depth (31 percent) and sediment deposition (about 30 percent) at the confluence of Shuqualak Creek with Noxubee River.

The storm of August 25, 1967 is typical of the flood-producing events that occur in this watershed. Total rainfall was 5.90 inches in 24 hours and represents the 5-year frequency storm event. The project will effect a reduction at the end of Reach 1 (Station 406+00) of 2 percent in peak discharge, 56 percent in acres flooded, and 44 percent in depth, at the end of Reach 2, (Station 166+50) of 51 percent in peak discharge, 78 percent in acres flooded, and 58 percent in depth.



CHANGES IN PEAK DISCHARGE, AREA FLOODED, AND DEPTH OF FLOODING

-26-

		Future Without Project			Future With Project		
Selected:		Peak	Area	Peak	Area	Depth:	
Frequency:	Station No.	Discharge: (CFS)	Flooded: (Ac)	Discharge: (CFS)	Flooded: (Ac)	Percent Reduction: (Ft.)	
Storms		1/(Ft.)		1/(Ft.)			
100-year, 24-hour	Channel #1	3,961	1.90	2.2	623	84	0
	50+75	6,482	4.29	2.8	3,296	49	1.15
	103+50	8,938	1,493	3.0	7,451	17	1,025
	218+11	9,014	2,528	6.2	7,601	16	1,808
	401+55	46+00	104	2.0	293	87	0
5-year, 24-hour	Below FWRS 2	2,320					
	Channel 1 #3	2,962	1.56	2.1	3,400	-15 2/	150
	50+75	2,015	1.56	1.5	424	79	0
	103+50	3,435	3.57	1.9	1,688	51	80
	218+11	4,642	1,185	1.8	3,941	15	449
2-year, 24-hour	401+55	4,447	2,028	4.3	4,370	2	887
	Below FWRS 2	46+00	1,232	84	1.4	192	84
	Channel 1 #3	110+00	1,458	1.18	1.4	1,787	-23 2/
	50+75	1,431	1.31	1.2	318	78	0
	103+50	2,496	298	1.5	1,138	54	0
2-year, 24-hour	218+11	3,409	940	1.6	2,770	19	50
	401+55	3,132	1,647	3.6	3,283	-5 2/	326
	Below FWRS 2	46+00	870	62	1.1	155	82
	Channel 1 #3	110+00	1,044	1.02	1.2	1,280	-23 2/
	50+75	1,044					

1/ Total acres above the section.
2/ Minus sign denotes an increase (in percent) in peak discharge.

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The remaining flood hazards adjacent to the city limits of the Town of Shuqualak are so infrequent that this area can be utilized with little or no limitation on the flood plain. A small undeveloped area of about two acres along a small depression in the extreme southeast corner of the town limits will flood up to a depth of about 0.4 feet from the 100-year frequency storm. Should the town expand south to and/or across the tributary below FWRS No. 2, there would be no danger from the 100-year frequency storm from the railroad west. There would be flooding from the railroad east to Highway 45 up to about 1.2 feet in depth. The flood plain from U. S. Highway 45 to Station 406+00 should be limited to high value row crops up to the elevation that will be flooded by the 100-year, 24-hour storm. This area should be restricted to agricultural use only. Areas above these elevations could be used for residential development if and when needed.

Land use in the flood plain without the project contains 27 percent cropland, 45 percent pastureland, 24 percent forest land, and 4 percent other land. The major row crops are cotton, corn, and soybeans. Land use in the flood plain with the project is estimated to be 60 percent cropland, 12 percent pastureland, 24 percent forest land, and 4 percent other land. The major crops will continue to be cotton, corn, and soybeans.

The area to be restored to former productivity after project installation in Reach 1 is 1,426 acres and can also be used more intensively; in Reach 2, 353 acres will be restored to former productivity, and can be used more intensively. This restoration to former productivity will not bring any new lands into agricultural use. No forestland will be cleared. The 2,097 acres of flood plain land in Reach 1 are now 1,426 acres open (cultivation, 357 acres; pasture, 1,069 acres) and 671 acres of forest and other land.

In the future the 2,097 acres are estimated to be 1,426 acres open (1,216 acres of cultivation, 210 acres pasture) and 671 acres of forest and other land. In Reach 2, there is presently 353 acres of open land (288 acres cultivated, 65 acres pasture) and 30 acres of forest and other land. In the future, the open land will remain the same, except that cultivation will increase to 345 acres and pasture will decrease to 8 acres. The forest land in Reach 2 under future conditions will remain the same as present. Flood plain land that was once in row crop has been converted to pasture because of the frequent flooding hazard, and in Reach 1 only about 17 percent is in crops and 51 percent is in pasture. More row crops, corn and soybeans will be planted in the flood plain with the reduced flooding frequencies. The removal of the flood hazard will permit increases in yield by allowing farmers to perform farming operations in a more timely manner. It will induce farmers to increase their development of on-farm water disposal systems, fertilize more efficiently, and carry out a better insect control program.

The annual watershed gross sheet erosion rates will be reduced as a result of the project by land use as shown on the following page.

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Land Upland and Water Problem Land	Gross Erosion				Reduction
	Present		With Project		
Ac.	T/Ac./Yr.	Ac.	T/Ac./Yr.	T/Ac./Yr.	
Cropland	3,281	30.2	2,681	22.6	7.6
Pastureland	2,219	5.9	2,779	4.4	1.5
Forest Land	10,836	4.3	10,969	3.2	1.1
Other Land	1,379	6.9	1,286	5.2	1.7
Bottom Land	3,895	0.0	3,895	0.0	0.0
Weighted W/S Average	21,610	7.8	21,610	5.3	2.5

The average annual sediment yield at the mouth of the watershed will be reduced from 51,00 tons or approximately 1,158 milligrams per liter to 20,000 tons or approximately 454 milligrams per liter. This amounts to approximately a 61 percent reduction.

The total area benefited by structural measures is 2,480 acres and is owned or operated by 15 beneficiaries. The benefited area is all privately-owned and operated lands. The vast majority of the beneficiaries have holdings of less than 100 acres in the benefited flood plain area. The size of ownership ranges from about 20 acres to one ownership of several hundred acres. However, there are a large number of workers with the large ownership that will be indirectly benefited by the structural measures. The percent reduction in damages is as follows: crops and pastures, 73 percent; other agricultural, 70 percent; and non-agricultural (roads and bridges, etc.), 89 percent.

Fish and Wildlife and Recreation

Channel No 1 will be realigned from Station 278+00 to Station 406+00 (2.4 miles) and enlarged from Station 166+50 to Station 278+00 (2.1 miles). Channel No. 3 will be realigned from Station 110+00 to Station 145+00 (0.7 mile).

The 5.2 miles of proposed channel work will not possess the qualities of a natural channel ecosystem. The meandering course of the existing channels has numerous idle areas and food and cover plants scattered along the streams that provide a source of food for upland wildlife species and habitat for species dependent upon an aquatic ecosystem. The proposed channel will cause less diversity of both plant and animal life present. Much of the area along the existing channel provides a diversity of cover and food for wildlife species which breaks the pattern of the large fields.

Summer flooding no doubt causes some mortality of rabbits and ground nesting birds. However, the flooding which occurs during the winter and early spring causes no significant losses to wildlife populations. The reduction of early and mid-summer flooding will reduce the mortality rates of rabbits and ground nesting birds. Changes in wildlife populations will be dependent to a large degree upon the distribution of food and cover remaining within the watershed. Cover will, in some areas, be a limiting factor for quail, rabbit, deer, turkey,



and other non-game species. Loss of aquatic habitat along the existing channel will result in a decrease in populations of mink, muskrat, and raccoon.

The installation of the project will eliminate the five acres of Type 4 and Type 6 wetland beaver ponds. The three-acre beaver pond in the sediment pool area of Structure No. 2 and a small beaver pond within the sediment pool area of Structure No. 1 will be replaced with impounded water. The remaining small beaver ponds within the channel itself will be eliminated. There are suitable locations in the immediate surrounding areas where the beavers can move and rebuild their homes. There will be little or no effect on the 360 acres of wooded flood plain (Type 1 wetland) at the extreme eastern end of the watershed because there will be no project measures in that reach of the flood plain and because of the continued flooding from the Noxubee River. The additional 435 acres of flood plain (Type 1 wetland) will be eliminated as a result of the project. However, the elimination will not result in a significant loss of waterfowl habitat because of the infrequent and short duration flooding under present conditions. Likewise, there will be a limited reduction in the amount of fish foraging habitat.

Sediment will become a temporary problem with increased turbidity and decreased water quality during the construction of project channels and have minor detrimental effects on fisheries and wildlife resources in the lower reaches of Shuqualak Creek and the Noxubee River downstream from Shuqualak Creek. The reduction in gross erosion rates and sediment delivered from upland areas will reduce the amount of fertilizer, insecticides, and herbicides delivered to the stream system under present volume uses of these materials.^{1/} This will be offset somewhat by changes in land use from pastureland to cropland. The reduction of flooding will reduce the amount of flood plain scour, thereby further reducing the amount of sediment delivered to the stream system. Also, the reduction in flooding will reduce the opportunity for floodwaters to wash applications of fertilizers, insecticides, and herbicides into the stream system.

Quality and quantity of food within the project will increase, but the availability may decrease because of inadequate cover in proper distribution with food sources. Availability of food for waterfowl will decrease since frequency and duration of flooding will be reduced. The forest land habitat and brushy vegetation present in the existing channel will be temporarily lost when the proposed channel is constructed. An increase in stream water temperature will result where large trees and bank vegetation are removed. The cool-water flow through devices in the outlet work of Structures 1 and 2 will provide a steady flow of cool water.

Floodwater Retarding Structure No. 1 has medium potential for incidental recreation in the form of fishing because of its proximity to a north-south county road and about one and one-half miles south of Shuqualak. This structure has little potential for boating and swimming because of lack of access roads and because of the relatively shallow depth of water in the sediment pool area. Floodwater Retarding Structure No. 2 has little potential for incidental recreation because of the lack of access roads and lack of proximity of an adequate travel road.

1/ Minutes of ARS-SCS Workshop on Pollution, June 22-24, 1971, USDA Sedimentation Laboratory, Oxford, Mississippi. Papers by Rausch, McDowell, S. J. Smith, and G. D. Smith, all of ARS



The sponsors will not acquire sufficient land and/or land rights for public access and/or public use of the structures. The structures will be located on private land and will be under private control except for the flood prevention and sediment trapping aspects of the structures which will be under the control of the sponsors.

There are no rare or endangered species in the watershed.

Archeological, Historic, and Scientific

There are no known archeological, historical, or scenic values which will be affected by the installation of the project. There are a number of known Indian camp sites and villages in the watershed. It was thought at first that spoil from channel work might be spread on two sites. Further study, however, showed that none of the known sites would be affected.

Economic and Social

Unemployment and underemployment are common in the project area. Local labor expected to be used during installation of the project will amount to an estimated 39,200 man-hours. Local labor will also be used for operation and maintenance of the project and estimated to be about 265 man-hours annually for the project life.

The increase in annual net income that will accrue due to the project will create 36 new jobs for local people. Also, three new jobs will be created in the transportation, wholesale and retail, and service employment sector. Permanent employment will increase by 39 jobs due to the project.

The reduction in frequency of flooding, area flooded, and the land use adjustments to be accomplished will permit a more economical farming operation by the use of multi-row equipment; longer and better row arrangement; less rebreaking, replanting, and recultivation. This will result in a more efficient operation, reduced cost, and increased net return to farmers, including the low income farmers. Approximately 60 percent of the total farms have gross incomes of less than \$2,500 annually.

The economy will be improved by increasing net farm income and by decreasing unemployment. This improved economy will help make it possible for farm families to remain in the farming business. This will result in a reduction of farmer migration to the cities. The expanded economy and preservation of the rural open space will maintain the population distribution and enhance the quality of human life.

There will be a reduction of \$12,200 in road and bridge damages annually. This reduction in expense of road repairs will allow these funds to be used for provision of new facilities and services.

There will be no displacement of persons, businesses, or farm operations as a result of project installation.



Application of the planned forestry measures and the additional technical assistance will not only help reduce erosion and runoff, but will also enhance recreation, wildlife and wood production values. The well-managed forests will continue to enhance the aesthetic and environmental aspects of living in the watershed.

The promotion of the Overall Economic Development Programs (OEDP) for Noxubee County as prepared by the county development organization, will be greatly enhanced by the watershed work plan. Shuqualak Creek was the first priority for a watershed project, and it incorporates many of the agricultural (cropland, pastureland, woodland, and watershed) objectives of the Rural Area Development Plan of Works.

Other

The acres of land, by land use, that will be committed in the installation of the structural measures are as follows: 165 acres of cropland, 185 acres of pastureland, 517 acres of forest land, and 52 acres of other land. Wildlife habitat will be altered by the commitment of these acres. The wildlife habitat of the 153 acres that will be taken up by permanent water will be changed from upland game species to fish and waterfowl. There are 585 acres of wildlife habitat in the flood pools that will be influenced very little by the installation of the project. There are 181 acres of wildlife habitat that will be temporarily lost due to construction of channels, dams, and emergency spillways.

The project measure installation will result in little or no effect on any presently existing mineral activity or on potential future mineral activity, as only a very small percentage of the land will be committed to channels and floodwater retarding structures.

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FAVORABLE ENVIRONMENTAL EFFECTS

1. Erosion will be reduced.
2. Total sediment leaving the watershed will be reduced about 61 percent.
3. Flooding depths will be reduced by an average of 31 percent for the 100-year frequency storm and 100 percent for the 1-year frequency storm except for the wooded reach downstream from the channel work end at Station 406+00 where flooding will occur on the average of about three times per year.
4. Approximately 153 acres of permanent lake fishery and waterfowl habitat will be created by the construction of two floodwater retarding structures.
5. Fish and wildlife habitat will be enhanced by the installation of land treatment measures on 2,930 acres, the construction of 17 new farm ponds, and the installation of 2 floodwater retarding structures.
6. Road and bridge damages will be reduced.
7. The economy of the watershed will be improved by the reduction of flooding events and duration of flooding, by providing additional employment, by land use adjustment, and by more efficient operation.
8. There will be 2,480 acres of land that will have reduced flooding.
9. Flood damages will be reduced 74 percent.
10. The cool-water flow through devices in Structures 1 and 2 will provide a steady flow of cool water.

ADVERSE ENVIRONMENTAL EFFECTS

1. Temporary increased turbidity, decreased water quality, and channel silting due to sediment disturbance during the construction period.
2. Loss of woody vegetation on 30 acres of forest land and associated wildlife habitat on a total of approximately 142 acres of channel banks during construction.
3. Loss of agricultural use, timber production, and wildlife habitat on 79 acres of cropland, 37 acres of pastureland, and 37 acres of forest land due to the formation of the sediment pools.
4. Periodic interruption of agricultural, silvicultural, and wildlife use on 2 acres of cropland, 83 acres of pastureland, 450 acres of forest land, and 50 acres of other lands due to the fluctuation of the flood pools during periods of precipitation.
5. Loss of 19 acres of cropland and 20 acres of pastureland due to the construction of the dams and spillways of the floodwater retarding structures.

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6. The ambient air quality will be temporarily affected during disposal of waste materials.
7. The disturbance of the five acres of Type 4 and 6 beaver pond wetlands will cause temporary dislocation of the beavers' living therein.
8. There will be an elimination of 435 acres of Type 1 wetland and its insignificant waterfowl habitat and a slight reduction in the amount of flooding on the 360 acres of wooded Type 1 wetland at the extreme eastern end of the watershed.
9. There will be an increase in water temperature in the reach of stream where large trees or other bank vegetation are removed.

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ALTERNATIVES

A number of alternatives were considered in the project evaluation process. The more reasonable of these alternatives were evaluated to the point of estimating costs and impacts. Among the alternatives considered were: (1) establishment of needed land treatment in the watershed at an accelerated rate; (2) accelerated land treatment and floodwater retarding structures; (3) land treatment and channel work only; (4) accelerated land treatment, floodwater retarding structures, and channel clearing; (5) accelerated land treatment, flood proofing, and conversion of land to less intensive use; and (6) no project. A number of combinations of structural measures were tested in arriving at the measures outlined in this plan. Some of these included various locations and combinations of structural measures both individually and in combination.

1. The alternative of establishing land treatment measures at an accelerated rate only involved the installation of measures described under the heading of Planned Project - Land Treatment. This would eliminate the occurrence of projected project induced adverse effects as listed: (1) temporary increased turbidity, decreased water quality, and channel silting due to channel disturbance during the construction period; (2) loss or reduction of wildlife habitat on 352 acres of open land, 517 acres of forest land, and 50 acres of other land; and (3) adverse effect on ambient air quality during construction. Erosion and associated sedimentation would be reduced 25 to 30 percent. Fish and wildlife habitat would be improved through the installation of such measures as ponds, stocking and management of ponds for fish, odd area wildlife plantings, vegetation of eroding acres, wildlife habitat improvement and preservation, and multiple use management of forests. Floodwater damages would be reduced by about three to four percent. The cost of such a program was estimated to be about \$209,400.
2. A second alternative considered included accelerated land treatment, the two floodwater retarding structures included under "Planned Project", and one other structure located across three small streams northeast of Shuqualak just upstream from the pipeline and downstream from Highway 45. This alternative would eliminate the projected channel work and the resultant loss of 30 acres of woody vegetation and associated wildlife habitat on a total of 142 acres. The projected increased turbidity, decreased water quality, and channel silting due to sediment disturbance during the channel construction period would be eliminated. This alternative would create a loss of reduction of wildlife habitat on 496 acres of open land, 575 acres of forest land, and 50 acres of other land. A total of 95 acres of forest land would be cleared in the construction of this alternative. Erosion and associated sedimentation would be reduced 50 to 55 percent. Fish and wildlife habitat would be improved through the installation of 293 acres of surface water in the floodwater retarding structures, construction of ponds, stocking and management of ponds for fish, odd area wildlife plantings, vegetation of eroding acres, wildlife habitat improvement and preservation, and multiple use management of forests. Floodwater damages would be reduced by about 55 percent. The cost of such a program was estimated to be \$1,105,400.

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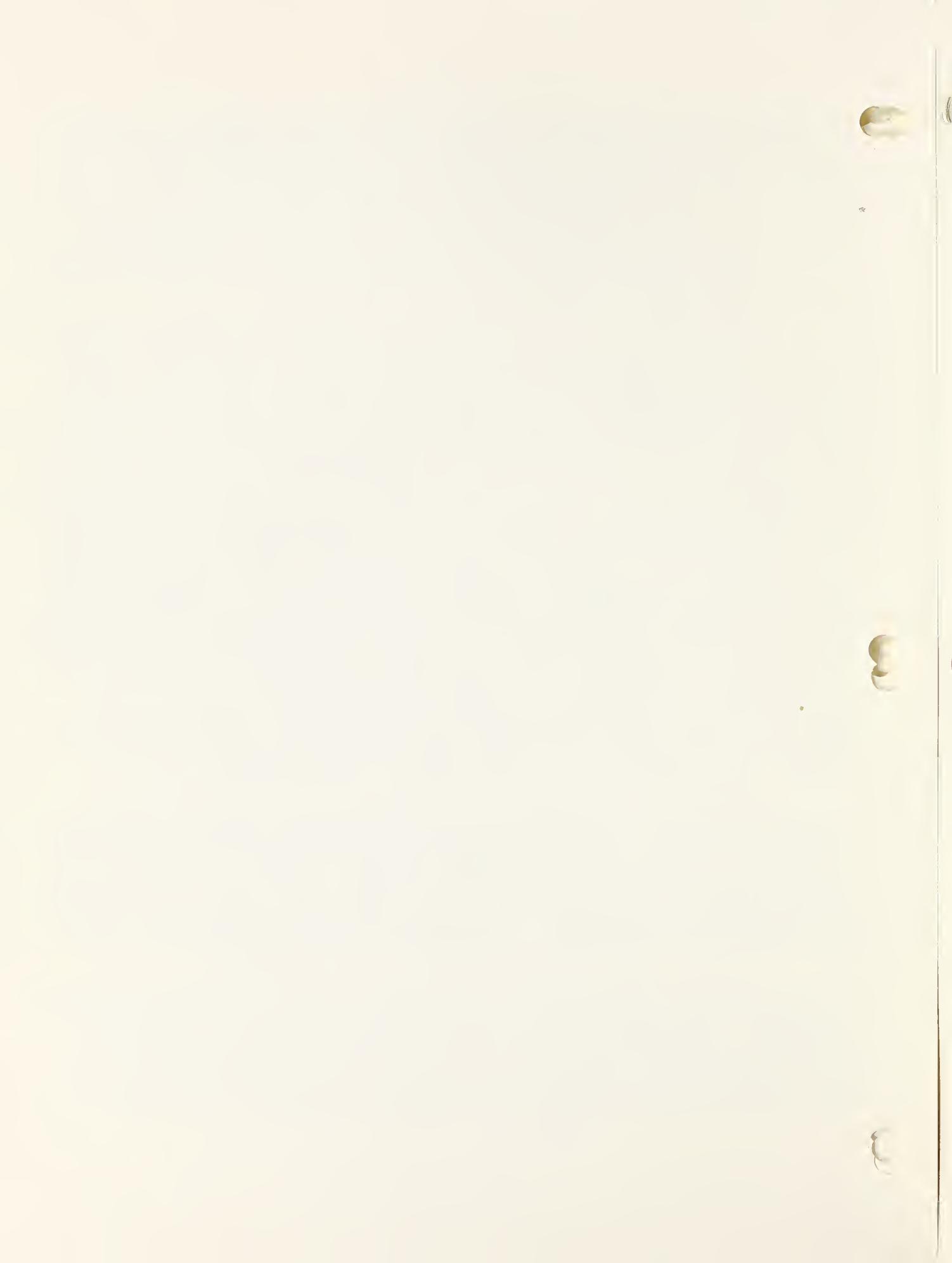
3. An alternative which consisted of accelerated land treatment, the two floodwater retarding structures included under "Planned Project", a floodwater retarding structure located across three small streams northeast of Shuqualak just upstream from the pipeline and downstream from Highway 45, and the channel work included in the "Planned Project". This alternate would provide a better degree of protection than does the planned project. However, the increase in benefits would not be equal to the increase in costs. This alternate would result in an additional 83 acres of forest land clearing and an additional 140 acres of surface water as compared with the planned project. The cost of this program was estimated at \$1,305,000.

4. An alternative quite similar to the one just previously described but with a reduced amount of channel work was evaluated. This alternate, also, would provide a better degree of protection than the planned project, but not to the degree provided by alternate 3. The increase in benefits would not equal the increase in costs. This alternate would result in an additional 75 acres of forest land clearing and an additional 140 acres of surface water as compared with the planned project. The cost of this program was estimated at \$1,286,200.

5. Another alternative considered was accelerated land treatment in combination with channel work only. This alternative would retain the favorable impacts of the land treatment alternative but would require extensive channel excavation. This alternative would lessen the loss or reduction of wildlife habitat on 240 acres of open land, 487 acres of forest land, and 50 acres of other land in the elimination of the floodwater retarding structures. The channel rights-of-way for this alternative would be about 245 acres of which 100 acres are forest and would be cleared. There would be an increase in the amount of temporary increased turbidity, decreased water quality, and channel silting due to sediment disturbance during the construction period. The same impacts as listed for the land treatment only alternative would be present for this alternative. An additional adverse impact of increased peak flows at the downstream end of the project would be anticipated. Flood damages would be reduced by about 60 percent. The estimated cost of this program was about \$542,500.

6. An alternative of accelerated land treatment, two floodwater retarding structures included in the "Planned Project" section, and channel clearing was considered. Favorable impacts associated with land treatment measures and the floodwater retarding structures would be retained. The adverse effect of temporary increased turbidity, decreased water quality, and channel silting due to sediment disturbance during the construction period would be greatly reduced but would remain in a minor degree. Flood damages would be reduced by this alternative to about 63 percent and the estimated cost was \$911,200.

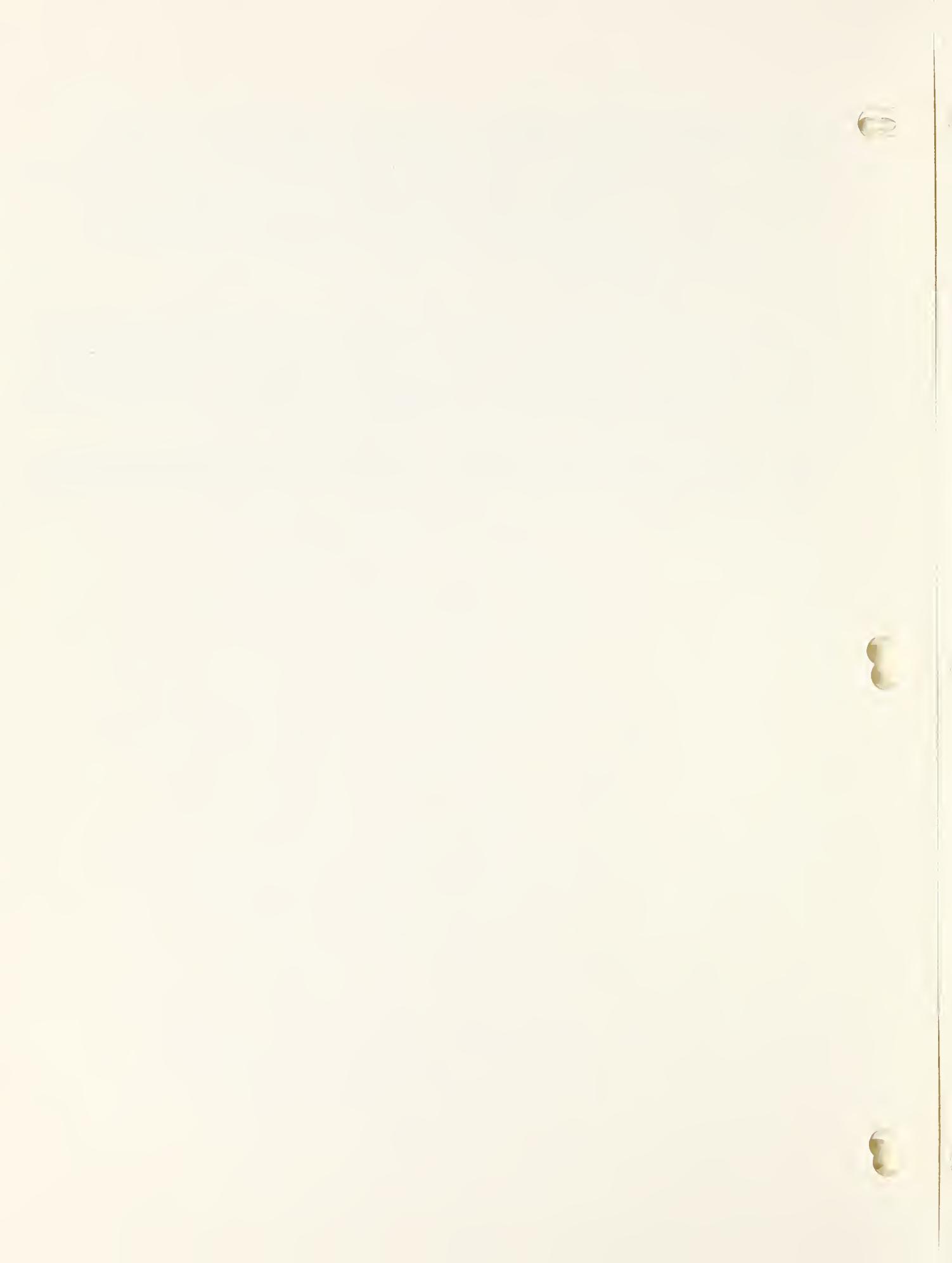
7. An alternative of accelerated land treatment, flood proofing, and converting present agricultural flood plain to uses less susceptible to flood damages was considered. This alternate would retain the favorable effects of the land treatment only alternative and would eliminate the possible adverse impacts of structural measures. In order to flood proof existing roads, railroads, and other property, it would be necessary to raise their useable levels above the



elevation of the 100-year frequency storm. About 0.3 miles of paved and 1.5 miles of gravel road, 0.2 miles of railroad, and several utility lines are affected. The conversion of present agricultural flood plain to uses less susceptible to flood damages would require changed land use of about 2,132 acres of land now used for growing crops and improved pastures. This conversion would result in the loss of agricultural income of about \$195,700 per year. The estimated cost of the flood proofing aspect of this program is \$929,000. Authorities for implementing the flood plain conversion features of this program are currently not available.

8. The no project alternative would not eliminate or lessen any of the problems that exist in the watershed. Any adverse impacts resulting from the project would, however, be eliminated. The use of this alternative would not result in any more or any less flooding in the Shuqualak flood plain. It is estimated that a net annual average benefit of \$64,400 would be lost to the people of the watershed if this alternative course of action is used.

Land treatment and structural measure alternatives evaluated during project formulation for costs and benefits are shown in the table on the following page.



STRUCTURAL
ALTERNATIVES EVALUATED 1/

Alter-	Floodwater:	Average Annual	Structure	Woodland:	Permanent
nate	: Retarding : Channel	: Acres :	: Installation:	Clearing:	Pool
	: Structure : Work	: Flooded:	Benefits:	Cost	(ac) : (ac)
		: \$: \$		
1	: None:	None: 4,018	: 4,200	: 0	: 0
2	: 1,2,&3A:	None: 1,842	: 96,000	: 896,000	: 110
3	: None: 12 Miles	1,549	: 104,000	: 333,100	: 100
	: Excava-:				
	: tion :				
4	: 1&2: 5.2 Miles	3,045	: 56,000	: 701,800	: 84
	: Clearing:				
5	: 1,2,&3:	None: 2,559	: 72,000	: 712,800	: 55
6	: 1,2,4,&5:	None: 2,289	: 82,000	: 832,000	: 85
7	: 1,2,3,&5:	None: 2,343	: 81,000	: 828,500	: 80
8	: 1,2,3,&4:	None: 2,199	: 87,000	: 820,200	: 75
9	: 1,2,3,4,&5:	None: 1,931	: 97,000	: 935,900	: 100
10	: 1&2:	None: 2,921	: 59,000	: 608,900	: 37
11	: 1,2,&5:	None: 2,745	: 66,000	: 724,600	: 65
12	: 1,2,&4:	None: 2,521	: 74,000	: 716,300	: 60
13 2/	: 1&2: 5.2 Miles	804	: 130,000	: 823,900	: 120
	: Excava-:				
	: tion :				
14	:				
(Proj.):	: 1&2: 5.2 Miles	1,409	: 112,300	: 789,100	: 110
	: Excava-:				
	: tion :				
15	: 1,2,&3A: 5.2 Miles	944	: 126,000	: 1,175,700	: 193
	: Excava-:				
	: tion :				
16	: 1,2,&3A: 5.2 Miles	1,295	: 120,500	: 1,156,900	: 185
	: Excava-:				
	: tion :				
	: Reduced :				
	: size :				
	: from :				
	: Alt. 15:				

1/ All alternates include land treatment

2/ The channel excavation shown in alternate No. 13 was extensive enough to provide channel capacity sufficient to contain the 5-year frequency storm runoff within the channel banks.

SHORT -TERM VS. LONG -TERM USE OF RESOURCES

The Shuqualak Creek Watershed lies within the Tombigbee River Basin which is located in the South Atlantic Gulf Water Resource Region as designated by the Water Resources Council. According to the Tombigbee River Basin Water and Related Land Resources Report for Mississippi and Alabama, there are 55 upland



watersheds in this basin. According to this report, 30 of these watersheds have a benefit-cost ratio exceeding 1.2 to 1.0, 8 watersheds are marginal, and 17 are not feasible as a watershed project under Public Law 566.

Seven PL-566 watersheds have been planned and approved for operation, one is in review, two are now being planned, and one is on priority to be planned. Land treatment and structural measures are complete on one of these watersheds and three are presently under construction.

The projects as designed will reduce flood damages, reduce erosion, reduce production cost, reduce maintenance cost to public roads and bridges, improve the efficiency of farm operations, improve the economic base, and generally improve the living conditions and standards of living for the landowners in the area.

Land in the flood plain of Shuqualak Creek is primarily open land presently used for crops and pasture. The future land use is expected to be mostly cropland as the open land is restored to former use. There is no expected land use change in the forest land acres of the flood plain. The planned project is compatible with current and expected future uses both within the watershed and the county. Implementation of the project as proposed should not preclude any options available for long-term use of the area. The project is expected to remain effective in conserving land and water resources beyond its design life.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The only commitments of resources resulting from the project are (a) the commitment of 39 acres of agricultural lands to dams and spillways, (b) the inundation of 79 acres of cropland, 37 acres of pastureland, and 37 acres of forest lands by the sediment pools, (c) the inundation of about 2.3 miles of ephemeral stream channels by the sediment pools of the two floodwater retarding structures, (d) the commitment of about 10 acres to channel works, and (e) the necessary capital, materials, energy, and labor required to install the project. No other permanent commitment of resources is known to be required for this project.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

General - About four informal meetings among local people of the watershed area were held about 1965, to discuss the pro's and con's of participating with the Soil Conservation Service in a PL-566 watershed project. They invited Commissioners from the Noxubee County Soil and Water Conservation District and/or the County Agent to some of these meetings.

A field study report was made for this watershed by the Starkville Watershed Planning Staff on September 8, 1965, with the local people being informed of the findings at a meeting in October 1965, where they were advised that a physically and economically sound project could be developed.

In August of 1966, a field examination was made by the Starkville Watershed Planning Staff and results reported to the State Office for transmittal to the State Soil Conservation Committee for their approval and action in establishing



priority of planning. They placed this watershed on the Tombigbee Supplemental Priority List. On September 12, 1969, the State Soil Conservation Committee approved the moving of this watershed into active planning. Local sponsors were notified of this on September 26, 1969, and plans for obtaining necessary data were discussed. The local sponsors adopted a motion asking the Service to proceed with the Watershed Work Outline and Watershed Work Plan as soon as possible.

On September 10, 1970, the State Conservationist wrote to each of the interested state and federal agencies about the start of planning for this watershed and asked for their specific interests and for any inputs or suggestions they might wish to contribute. Several responded including the Mississippi Air and Water Pollution Control Commission, Bureau of Sports Fisheries and Wildlife (USDI), National Park Service (USDI), Federal Water Pollution Control Administration (USDI), and others. The Mississippi State Highway Department had indicated their interest earlier in a letter of November 20, 1969. On December 9, 1969, a meeting was held with U. S. Navy personnel, local sponsors, and the SCS to discuss the Navy's interest. On December 22, 1969, the Commanding Officer of the Naval Air Station, Meridian, Miss., wrote to the Chairman of the Watershed Commissioners that the Navy interposes no objection to the location of a FWRS located west of the access road to OLF Alpha which would flood a portion of Navy property. He also indicated that the normal operation of the field would not be impaired by a portion of the field being in the flood pool.

The Bureau of Sport Fisheries and Wildlife, in cooperation with the Mississippi Game and Fish Commission, made a reconnaissance study of the watershed area and gave the SCS a copy of the report of this study, along with recommendations for future actions. This report was concurred in by the Mississippi Game and Fish Commission. The Stream Survey Leader of the Mississippi Game and Fish Commission made a study of this watershed area and made a copy of his report available for SCS consideration. A joint study was made in the watershed area by biologists from BSF and W, Miss. G&FC, and SCS to develop a common understanding of watershed interests. In addition, the SCS biologists made several studies on their own to determine the resources and impacts.

The Mississippi Department of Archives and History furnished us a copy of a report on the archeological survey work performed in the watershed on April 7-8, 1971, by Professor Richard A. Marshall and some of his students at Mississippi State University.

The U. S. Forest Service personnel, the Watershed Planning Staff Economist, the engineering survey crew, watershed planning staff members, local SCS personnel, watershed commissioners and Soil and Water Conservation District Commissioners made numerous contacts with local interested farmers and local public about the Watershed Plan and progress.

The U. S. Forest Service made contributions to the narrative and tables of the watershed work plan. Recommendations of other agencies, both Federal and State, were taken into consideration in developing the draft watershed work plan.



The steps necessary to comply with procedures described in the Advisory Council on Historic Preservation Procedures for the Protection of Historic and Cultural Properties (36-CFR-800) were accomplished through exchanges of correspondence and watershed material between the Service and the Mississippi Department of Archives and History (the director is the SHPO) in October and November 1970, January 1972, and August 1975. Also, representatives of the two groups met together for mutual discussions.



Discussions and Disposition of Each Comment on Draft Statement

Comments were requested from the following agencies:

U. S. Department of the Army
U. S. Department of Commerce
U. S. Department of Health, Education and Welfare
U. S. Department of the Interior
U. S. Department of Transportation
Environmental Protection Agency
Federal Power Commission
Advisory Council on Historic Preservation
Governor, State of Mississippi
Federal-State Programs, Office of the Governor
Golden-Triangle Planning and Development District
Office of Equal Opportunity, USDA

The following agencies have responded: U. S. Department of the Army, U. S. Department of Health, Education and Welfare, U. S. Department of the Interior, U. S. Department of Transportation, Environmental Protection Agency, Federal-State Programs, Office of the Governor, and Golden-Triangle Planning and Development District.

Each issue, problem, or objection is summarized and a response given on the following pages. Comments are serially numbered where agencies have supplied multiple comments. The original letters of comment appear in Appendix C.

U. S. Department of the Army

Comment: The Department of Army states, "The draft of the environmental statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned".

Response: No response required.

U. S. Department of Health, Education and Welfare

Comment: The Department of Health, Education and Welfare states, "We have reviewed the impacts of the proposed action from the standpoint of this Department's areas of concern and find that we do not have any comments to make".

Response: No response is required.

U. S. Department of the Interior

(1) Comment: The Department suggested that a component of the environmental objective, cultural resources be included, as a plan element on page 14 or 15 of the work plan addendum.



Response: The section of the work plan addendum referred to above was titled "Environmental Quality Alternative" in the draft document. The section is retitled "Abbreviated Environmental Quality Plan" in the final documents. A component need of protection of cultural resources is included in the addendum of the final work plan in the section mentioned above.

(2) **Comment:** The Department comment reads, "Preliminary archeological investigations indicate a potentially rich archeological area. The work plan agreement should contain information on the responsibilities of the United States Department of Agriculture, Soil Conservation Service, and the sponsoring local organizations in complying with cultural resource preservation procedures. Land treatment measures which may be the responsibility of the sponsoring local organization as presented may affect cultural resources. The impact may be either primary or secondary. Inadvertent destruction or alteration of cultural resources of local, regional or national significance must be avoided. Compliance with the preservation procedures might effect discussion throughout the work plan."

Response: The installation or the noninstallation of land treatment measures on individual farms are the sole responsibility of the landowner or operator. The Soil Conservation Service provides technical assistance to the Soil and Water Conservation District which in turn assists the individual landowner or operator in the planning and installation of land treatment measures. It is service policy to carry out the provisions of PL 93-291 which requires that the Secretary of the Interior be notified in the event that an agency finds or is notified in writing by an appropriate historical or archeological authority that its activities may cause irreparable loss or destruction of significant scientific, prehistorical, historical or archeological data. Since the sole responsibility for the land treatment measures rests with the landowner or operator the work plan agreement should not be modified as suggested.

(3) **Comment:** The Department indicated that the discrepancy in the stated acreage of forest land as stated in paragraph 6 on page 5 and in paragraph 1 on page 6 should be corrected.

Response: Agreed. The appropriate sentence in paragraph 6, page 5, has been modified to read "Approximately 750 acres of hard-wood forest are located in the bottom land at the extreme east end of the watershed". Immediately following the above sentence a new sentence was added. This sentence reads "About 360 acres of this bottom land is within the Shuqualak Creek flood plain."



(4) Comment: The Departments comment No. 4 reads as follows: "We note that wetlands have not been classified in the watershed, page 10 of the work plan. Paragraph 2 states that "Some waterfowl use the flood plain, especially soybean fields and the hardwood timber when flooding occurs in the winter months," and paragraphs 3 and 5 acknowledge that farm ponds, small lakes, and small beaver ponds are found in the watershed. U. S. Department of the Interior, Fish and Wildlife Service, Circular 39, "Wetlands of the United States," classifies seasonally flooded basins as Type 1 wetlands. Also, beaver impoundments are classified as meadows (Type 2), shrub swamps (Type 6), and wooded swamps (Type 7). A complete survey of the watershed should be made to verify the types of wetlands present, and an evaluation of the impact of the project on these wetlands should be presented."

Response: Agreed. At the time the draft watershed documents were prepared, an analysis of the flood plain lands as related to descriptions of wetlands contained in the above mentioned Circular 39 had determined that, with a few minor exceptions, there were no wetlands in the Shuqualak Creek Watershed. The possibility or probability of wetlands in the watershed up to the time of the Interagency Review had not been mentioned by the people or agencies with expertise in that field. However, since the question has now been raised, we have made further study of the possibility of wetlands in the watershed. The beaver ponds are being included in the work plan and environmental impact statement as Type 4 and Type 6 wetlands. Their total surface is about five acres and with one exception they are within channel banks. The one exception is a pond about three acres in size which is located near the upper end of the proposed sediment pool of Structure No. 2. The 360 acres of wooded flood plain at the extreme eastern end of the watershed could possibly have sufficient flooding from Shuqualak Creek and Noxubee River to be classified as Type 1 wetlands and we are including it in the work plan and EIS as such. In addition we are classifying as Type I wetland one-half of the land that will flood on the average of two times per year for the remainder of the flood plain area even though the flooding duration will be very short, normally less than 24 hours. This will amount to about 435 acres.

(5) Comment: The Department quoted two sentences from page 27 of the work plan "All earthen embankments will be vegetated with grasses and/or legumes with high value for wildlife food and cover. Included for consideration for planting will be such grasses as bermuda, bahia and fescue, and legumes including common and Sericia lespedeza," site a reference indicating bermuda grass to be of minor value for wildlife, and suggested that vegetation of greater value as a wildlife food plant than be considered for stabilizing embankments.



Response: We have rewritten the two sentences to indicate that stabilization of the embankment is the primary purpose of the vegetation. However, if stabilization can be achieved with plants that have values for wildlife, then such plants will be considered in the vegetative plan. (Work Plan - p. 27, Environmental Impact Statement - p. 3)

(6) **Comment:** The Department stated, "Reduction of flooding will reduce the amount of flood plain scour, but it is questionable that the amount of sediment delivered to the stream system will be reduced, page 38. Sediment picked up from the banks and bottoms of the improved channels will likely be increased because the velocities will be increased. Degrading and channel enlargement may be anticipated in the reaches immediately downstream from the proposed dams. With the design velocities and erodible bank and bed material, it is likely that sediment will be a continuing problem rather than a temporary one as stated on page 38, paragraph 3, and that the detrimental effects on fisheries and wildlife resources will be more than minor."

Response: The studies made by the service to estimate the reduction in sediment as a result of the project being installed considered the above factors. The improved channels are designed with nonscouring velocities. Analysis indicates that the stability of the remaining stream system will remain relatively stable with the project installed. The anticipated reduction in sediment will be derived, with the exception of insignificant amounts, from the reduction in gross erosion as a result of the application of land treatment measures and the capturing of sediment in the sediment pools of the two structures.

(7) **Comment:** The Department further stated, "Also it appears likely that changing floodplain use from pasture to row crops will increase the amount of fertilizer, insecticides, and herbicides delivered to the stream system".

Response: We agree that the changing of floodplain land use from pasture to row crops will increase the amount of fertilizer, insecticides, and herbicides delivered to the stream system if this is the only change made and considered. However, if other factors such as reduced gross erosion from the uplands, especially cultivated uplands, the reduction in amount of cultivated uplands, the trapping of sediment in the sediment pools of the floodwater retarding structures, the reduced floodplain scour, and the reduced overbank flooding of crop and pasture lands are taken into account that, on balance, there will be an overall reduction of fertilizer, insecticides and herbicides entering the stream system.



(8) Comment: The Department's comment on page 40, paragraph 6, of the work plan is, "Anticipation of reduction in damages to roads and bridges is not reasonable. Increased channel velocities and channel deterioration have increased bridge damages in similar projects and may increase similar damages in this project. Additional information is needed to qualify the estimated damage benefits."

Response: The combined project of land treatment, floodwater retarding structures, and channel work will reduce the frequency and magnitude of overbank flooding and will result in less flooding to the roads and bridges. The design velocities of the planned channel work are slower or smaller than velocities that would result in scouring or bank erosion and are not expected to cause damage to bridge abutments or piers.

(9) Comment: The Department commented to the effect that the draft environmental statement fails to recognize the value of overbank flooding on fisheries resources and the final environmental statement should include a discussion of the benefits of flooding to natural ecosystems.

Response: A paragraph was added to the environmental setting sections of both the watershed work plan and the environmental impact statement to reflect the beneficial effects of flooding under present conditions in the Shuqualak Creek Watershed.
(WP - p. 10, EIS - p. 15)

(10) Comment: The Department stated, "We note that the National Register of Historic Places has been consulted to determine if there were any properties listed which would be affected by the project. The final statement should indicate that the most recent monthly supplement of the National Register was consulted."

Response: The work plan and environmental impact statement were revised to show that the National Register of Historic Places, dated February 4, 1975, and monthly supplements dated February 28, March 11, April 1, May 6, June 3, July 1, and August 5, 1975, were consulted. (WP - p. 12, EIS - p. 18)

(11) Comment: In relation to coordination with the SHPO the Department commented, "Documentation of coordination with the State of Mississippi Department of Archives and History should include a discussion of all of the steps requiring consultation with that Department's Director, Mr. Elbert Hilliard, who is the State Historic Preservation Officer (SHPO). The required steps are described in the Advisory Council on Historic Preservation (AHP) Procedures for the Protection of Historic and Cultural Properties (36 CFR 800)."

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Response: The archeological and historical review consisted primarily of consultation with the Mississippi Department of Archives and History and a search of the National Register of Historic Places. The consultation took place in October 1970 in correspondence between the Director, Division of Historic Sites and Archaeology and the State Conservationist, between the State Conservationist and the Watershed Planning Staff Leader, between the Watershed Planning Staff Leader and Director, Division of Historic Sites and Archaeology. In November 1970 it was decided that additional information would be needed and the Department of Archives and History authorized such a study and so informed the Watershed Planning Staff Leader. In April 1971 the survey was made by Professor Richard A. Marshall and some of his students at Mississippi State University. In January 1972 the Director, Division of Historic Sites and Archaeology, transmitted a copy of Professor Marshall's survey report to the Watershed Planning Staff Leader. This report indicated 10 archeological sites in the watershed, but none that would be affected by the proposed project measures. At that time it was felt that none of these 10 sites were significant enough to be considered for national register status. This is still the feeling as indicated by correspondence between the State Historic Preservation Officer and the Watershed Planning Staff Leader dated August 1975. (EIS - p. 40)

(12) Comment:

The Department, in commenting on archeological resources, stated, "The preliminary archeological survey conducted by Professor Richard A. Marshall during the period April 7 and 8, 1971, indicates the presence of ten archeological sites within the watershed. We understand that the Circle M Site Village was judged by him to be potentially eligible for nomination to the National Register of Historic Places."

Response:

Professor's report does indicate the presence of ten archeological sites within the watershed. However, the Professor's report went further and described eight additional sites outside the watershed that were recorded from information given surveyors by assisting persons (Mr. Jim Gates and T. W. Crigler). The Circle M Site Village was one of the eight additional sites and is outside of the watershed drainage area, thus is not affected by this watershed project. However, he did recommend that the site should be protected and placed in State Archaeological Landmark and on National Register of Historic Places.

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(13) Comment: The Department further stated, "We further understand that Professor Marshall recommended that more study was required. Additional survey work, performed by a professional archeologist, appears to be necessary in order to locate and identify other sites of potential cultural value within the entire area over which the project would have possible direct or indirect (secondary) effect."

Response: We do not believe that any additional survey work within the watershed area is indicated in Professor Marshall's report. For survey sites one through three the recommendations read - "None. Might be rechecked when in area for other possible evidence." For survey sites four through eight the recommendations read - "None. Might be rechecked when in area for other possible material." The recommendations for survey sites nine and ten read - "None. Should be checked to establish identity as a real site and to obtain sample collection for record." The report, however, did make some more specific recommendations for the eight sites that are outside the watershed area. This is probably where the thought originated that Professor Marshall recommended that more study was required.

(14) Comment: The Department provided the following statement, "In consultation with the SHPO the criteria of the ACHP guidelines (36 CFR 800.10) must be applied to the located cultural properties to determine if there exist any properties, including the Circle M. Site Village, that appear eligible for inclusion to the National Register. In order to obtain a determination of eligibility you must make a request, in writing, to the Secretary of the Interior. Instructions for making a request are enclosed for your ready reference."

Response: The criteria of the ACHP guidelines were applied to properties within the watershed project areas. For further information check response to Department of the Interior comment No. 11.

(15) Comment: The Department stated, "Significant adverse impact related to geologic conditions is not anticipated."

Response: No response required.

(16) Comment: The Department referred to the mineral resources of the watershed stating, "Mineral resources including limestone, clay, bauxite, and sand and gravel are listed on page 12 of the statement. The statement also states there is currently no production in the project area. However, potential impact of the project on the mineral resources is not described regarding existing and future mineral activity in the basin."



Response: A statement to the effect that the installation of the project measures will have little or no effect on any existing or any potential mineral activity is included in the "Effects of Works of Improvement" section of the work plan and the "Environmental Impacts" section of the EIS. (WP - p. 40, EIS - p. 31)

(17) Comment: The Department in commenting on the Environmental Impacts section of the EIS stated, "It is estimated (page 26, paragraph 2) that a 33 percent increase in floodplain croplands will result from the flood protection provided by the project. The final draft statement should discuss the increase in water pollution from sedimentation and pesticides in the area of project influence because of more expansive and intensive agriculture."

Response: This is essentially the same comment as a previous comment - (7) Comment. We agree that the changing of floodplain land use from pasture to row crops will increase the amount of fertilizer, insecticides, and herbicides delivered to the stream system, if this is the only change made and considered. However, if other factors such as reduced gross erosion from the uplands, especially cultivated uplands, the reduction in the amount of cultivated uplands, the trapping of sediment in the sediment pools of the floodwater retarding structures, the reduced floodplain scour, and the reduced overbank flooding of crop and pasture land are taken into account that, on balance, there will be an overall reduction of sediment, fertilizer, insecticides, and herbicides entering the stream system.

(18) Comment: The Department further commented on the impact section of the EIS stating, "There may be need to amend the environmental impact section of the EIS to include an assessment of the project's direct and indirect impacts upon cultural resources. For any cultural resource found eligible for inclusion to the National Register, the Agency Official in consultation with the SHPO, must apply the Criteria of Effect (36 CFR 800.8) and, if appropriate, take additional steps required by the ACHP procedures."

Response: The project will have no significant direct or indirect impacts on the cultural resources of the watershed; therefore, the environmental impact section of the EIS was not revised to reflect any impacts on cultural resources. No cultural resources are eligible for the National Register.

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(19) Comment:

The Department stated, "Those measures to be taken to mitigate impacts to cultural resources should be discussed as appropriate. If it is found that properties eligible for inclusion to the National Register will be irreparably lost or destroyed, then the requirements of the Act of June 27, 1960 (74 Stat. 220) relating to the preservation of historical and archeological data, as amended by the Act of May 24, 1974 (88 Stat. 174) must be fulfilled."

Response:

The project will have no significant impacts on cultural resources of the watershed, therefore, no mitigation measures were included. No cultural resources are eligible for the National Register and none will be irreparably lost.

(20) Comment:

The Department states, "The following effects should be included in the list of adverse environmental effects:

1. There will be an increase in water temperature where large trees and other bank vegetation are removed.
2. The acreage of various wetland types that will be lost or modified should be identified.
3. There will be an increase in water pollution with cumulative additions of salts, organic nutrients, and pesticides in the immediate project area and downstream because of more expansive and more intensive agriculture."

Response:

Items No. 1 and No. 2 as listed in the comment have been added to the list of adverse environmental effects. Item No. 3 was not added because it is considered that there will not be an increase in water pollution as a result of the total project actions.

(21) Comment:

The Department stated in regard to the "Consultation and Review with Appropriate Agencies and Others" section that, "This section should be expanded to reflect the results of cultural resources surveys and the consultative process required by the ACHP procedures."

Response:

The above-mentioned section was expanded to include a more detailed account of consultation between the Service and the Mississippi Department of Archives and History.

U. S. Department of Transportation

Comment:

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

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Response: No response required.

U. S. Environmental Protection Agency

Note: Prior to inclusion of these comments and responses in the final watershed work plan and environmental impact statement we asked EPA to review our responses before they were included in the final documents. The following is a quote from EPA's letter stating their views on our responses. "We have reviewed the Pre-Final of Shuqualak Creek Watershed in Noxubee and Kemper Counties, Mississippi, and find that our comments on earlier drafts of this project are satisfied."

(1) Comment: EPA indicated in their letter of comment that it would be helpful to know why the relatively large percentage of the watershed upstream from Channel No. 3 is not also protected with a flood control impoundment. Also, they would like to see an evaluation of a structure at that location, coupled with either the presently proposed channel work or slightly reduced channel work, so as to maximize the protection and benefit-cost ratio of the project.

Response: We have evaluated two additional alternatives. The first included a floodwater retarding structure (3A) upstream from Channel No. 3 in addition to the two floodwater retarding structures and the channel work included in the proposed project measures. The second additional alternative included a floodwater retarding structure (3A) upstream from Channel No. 3, channel work reduced in capacity from that included in the proposed project measures, plus the two floodwater retarding structures included in the proposed project measures. The two alternates were included in the plan formulation section of the work plan and the alternative section of the EIS. The inclusion of structure No. 3A in addition to the proposed project measures would increase the protection provided; however, the increased benefits would not offset the increased cost. The benefit to cost ratio for this increment would be 0.6 to 1.0 and would result in the overall project benefit to cost ratio dropping from 2.3 to 1.0 as shown for the presently proposed project down to 1.7 to 1.0. The inclusion of structure No. 3 along with reduced channel work would also increase slightly the protection provided as measured against the proposed project. Here again the increased benefits would not offset the increased cost. The benefit to cost ratio for this increment would be 0.4 to 1.0 and would result in the overall project benefit to cost ratio dropping from 2.3 to 1.0 down to 1.7 to 1.0. (WP - p. 23, EIS - p. 35)



(2) Comment: EPA suggested inclusion of the presently proposed project data both in the listing on pages 32 and 34 and in the table of structural alternatives evaluated on page 34.

Response: Our format for writing environmental impact statements does not allow a description of the proposed project in the alternative section of the EIS. The alternatives described here are alternatives to the proposed project. However, we are including the data for the proposed project in the table of structural alternatives evaluated so that you might have a more readily available source of data for a quick comparison. In addition, the response to Comment No. 1 gives the benefit to cost ratios for comparison of the project to the more recent alternatives. As an additional reference, the last two paragraphs of the "Project Formulation" section of the work plan discusses the selection of the project measures for inclusion in the plan. (WP - p. 24a, EIS - p. 37)

(3) Comment: EPA stated, "Finally if wetlands are involved in the project, consideration should be given to implications pursuant to Section 404 of Public Law 92-500. The final impact statement should state what is to be done to protect wetlands and to secure a 404 Permit and/or EPA approval before the wetlands are treated."

Response: The applicability of Section 404 of Public Law 92-500 (Federal Water Pollution Control Act Amendments of 1972) is now in litigation. It is not known at this time if there are 404 implications in this watershed. It is anticipated that the litigation will be ended prior to the start of construction and if Section 404 of Public Law 92-500 is applicable to this watershed, then the local sponsors will take the steps necessary to fully comply with the law. The installation procedures portion of the "Works of Improvement to be Installed" section of the work plan and the "Planned Project" section of the environmental impact statement have been modified to recognize possible 404 implications. (WP - p. 31, EIS - p. 7)

State Clearinghouse for Federal Programs

Note: The State Clearinghouse received all of the state agency review copies of draft work plan and EIS. The proper number of copies was then given to the Mississippi Board of Water Commissioners, who distributed the copies to the individual state agencies for review and comment. The Board of Water Commissioners collects the state agency responses, writes a state summary report, and returns to the Clearinghouse with all individual state agency letters of response attached. The Clearinghouse then attaches all of the material received to their response and makes it a part of their response.



(1) Comment: The State Clearinghouse stated that they had received notification of intent to apply for Federal assistance for the Shuqualak Creek Watershed Project.

Response: No response required.

(2) Comment: The State Clearinghouse stated, "Although there is no applicable State plan for Mississippi, the proposed project appears to be consistent with present state goals and policies."

Response: No response required.

(3) Comment: "This notice constitutes FINAL STATE CLEARINGHOUSE REVIEW AND COMMENT. The requirements of U. S. Office of Management and Budget Circular No. A-95 have been met at the State level."

Response: No response required.

(4) Comment: Mississippi State Highway Department - "The Draft Environmental Statement submitted with your letter dated February 11, 1975, has been reviewed by personnel in our Bridge Division. Based on this review, it has been determined that the proposed Shuqualak Creek Watershed Project, Noxubee and Kemper Counties, would have no significant effects on our highway facilities."

Response: No response required.

(5) Comment: State Game and Fish Commission - "We have reviewed the Draft Environmental Impact Statement on Shuqualak Creek Watershed dated January 1975, and do not wish to make any additional comments."

Response: No response required.

(6) Comment: Board of Water Commissioners - Stated that they had reviewed the Work Plan and Draft Environmental Statement, Shuqualak Creek Watershed Project, Noxubee and Kemper Counties, and had found no major objection to the overall project.

Response: No response required.

Golden Triangle Planning and Development District

(1) Comment: The GTPDD stated that the Regional Clearinghouse has received notification of intent to apply for federal assistance and has reviewed the application for federal assistance for the Shuqualak Creek Watershed.



Response: No response required.

(2) Comment: The GTPDD stated, "Although an applicable plan does not presently exist for the Golden Triangle Planning and Development District, the proposed project appears to be consistent with regional goals and objectives."

Response: No response required.

(3) Comment: The GTPDD stated that their response constituted final Regional Clearinghouse review and comment on the proposed plan.

Response: No response required.

List of Appendixes:

Appendix A - Comparison of Benefits and Costs for Structural Measures

Appendix B - Copies of Letters of Comment Received on the Draft Environmental Statement

Appendix C - Project Map

APPROVED BY

 Acting

W. L. Heard, State Conservationist

DATE

11-5-75

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APPENDIX A

COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Shuqualak Creek Watershed, Mississippi
(Dollars)

		AVERAGE ANNUAL BENEFITS ^{1/}			3/:		
Evaluation Unit	Damage Reduction	More Intensive Use	Development	Secondary	Total	Average Annual Cost	Benefit Cost Ratio
Floodwater Retarding Structures Nos. 1 and 2 together with Channels Nos. 1 and 3	80,000	15,700	6,100	10,400	112,200	43,000	2.6:1.0
Project Administration						4,900	
GRAND TOTAL	80,000^{2/}:	15,700	6,100	10,400	112,200	47,900	2.3:1.0

^{1/} Price base adjusted normalized.

^{2/} In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of \$4,200 annually.

^{3/} Based on 1974 prices for installation; adjusted normalized prices for O&M and 100-year evaluation period at 5-5/8 percent interest (.05649).

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ENVIRONMENTAL IMPACT STATEMENT
FOR
SHUQUALAK CREEK WATERSHED

APPENDIX B

Shuqualak Creek

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DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

Honorable Robert W. Long
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the State Conservationist of the Soil Conservation Service, by letter of 7 February 1975, requested the views of the Secretary of the Army on the work plan for Shuqualak Creek Watershed, Mississippi.

We have reviewed this work plan and foresee no conflict with any projects or current proposals of this Department. The draft of the environmental statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned.

Sincerely,

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)



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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

APR 17 1975

Mr. W. L. Heard
State Conservationist
Soil Conservation Service
Department of Agriculture
P. O. Box 610
Jackson, Mississippi 39205

Dear Mr. Heard:

We have reviewed the draft Environmental Impact Statement concerning the Shuqualak Creek Watershed, Mississippi. We have reviewed the impacts of the proposed action from the standpoint of this Department's areas of concern and find that we do not have any comments to make.

Thank you for the opportunity to review the document.

Sincerely,

A handwritten signature in cursive ink that reads "Charles Custard".

Charles Custard
Director
Office of Environmental Affairs

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United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In Reply Refer to:
ER-75/130

APR 23 1975

Dear Mr. Heard:

Thank you for your letter of February 7, 1975, requesting our views and comments on the draft environmental impact statement and work plan for the Shuqualak Creek Watershed, Mississippi. Our comments are presented below.

Work Plan

Environmental Quality Alternative

We suggest that a component of the environmental objective, cultural resources be included, as a plan element on page 14 or 15.

Watershed Work Plan Agreement

Preliminary archeological investigations indicate a potentially rich archeological area. The work plan agreement should contain information on responsibilities of the United States Department of Agriculture, Soil Conservation Service, and the sponsoring local organizations in complying with cultural resource preservation procedures. Land treatment measures which may be the responsibility of the sponsoring local organization as presented may affect cultural resources. The impact may be either primary or secondary. Inadvertent destruction or alteration of cultural resources of local, regional or national significance must be avoided. Compliance with the preservation procedures might effect discussion throughout the work plan.

Watershed Resources

It is stated on page 5, paragraph 6, "Approximately 750 acres of hardwood forest are located in the flood plain at the extreme east end of the watershed." However, page 6, paragraph 1,

CONSERVE
AMERICA'S
ENERGY



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states that, "Since there are only 720 acres of forest land in the flood plain area, most of the forest industries lands are in the non-flood area." This discrepancy in the stated acreage of forest land should be corrected.

We note that wetlands have not been classified in the watershed, page 10. Paragraph 2 states that, "Some waterfowl use the flood plain, especially soybean fields, and hardwood timber when flooding occurs in the winter months," and paragraphs 3 and 5 acknowledge that farm ponds, small lakes, and small beaver ponds are found in the watershed. U.S. Department of the Interior, Fish and Wildlife Service, Circular 39, "Wetlands of the United States," classifies seasonally flooded basins as type 1 wetlands. Also, beaver impoundments are classified as meadows (Type 2), shrub swamps (Type 6), and wooded swamps (Type 7). A complete survey of the watershed should be made to verify the types of wetlands present, and an evaluation of the impact of the project on these wetlands should be presented.

Improvements to be Installed

It is noted on page 27, paragraph 2 that, "All earthen embankments will be vegetated with grasses and/or legumes with high value for wildlife food and cover. Included for consideration for planting will be such grasses as bermuda, bahia and fescue, and legumes including common and Sericea lespedeza." Studies have shown that bermuda grass is of minor value to wildlife.^{1/} We suggest that vegetation of greater value as a wildlife food plant than bermuda be considered for stabilizing embankments.

We note that construction is expected to be accomplished on one side of Channel No. 3 between Stations 110 + 00 to 200 + 00, page 30, paragraph 3. We recommend the planting of a 50-foot wide strip of wildlife shrubs along the construction side of the channel.

Effects of Improvements

Reduction of flooding will reduce the amount of floodplain scour, but it is questionable that the amount of sediment

^{1/} Martin, Alexander C., Zinn, Herbert S., and Nelson, Arnold L., "American Wildlife and Plants," McGraw-Hill Book Company, Inc., New York, 1951, page 375.

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delivered to the stream system will be reduced, page 38. Sediment picked up from the banks and bottom of the improved channels will likely be increased because the velocities will be increased. Degrading and channel enlargement may be anticipated in the reaches immediately downstream from the proposed dams. With the design velocities and erodible bank and bed material, it is likely that sediment will be a continuing problem rather than a temporary one as stated on page 38, paragraph 3, and that the detrimental effects on fisheries and wildlife resources will be more than minor. Also, it appears likely that changing floodplain use from pasture to row crop will increase the amount of fertilizer, insecticides, and herbicides delivered to the stream system. Clarification of these factors should be included in the final document.

Page 40, paragraph 6: Anticipation of reduction in damages to roads and bridges is not reasonable. Increased channel velocities and channel deterioration have increased bridge damages in similar projects and may increase similar damages in this project. Additional information is needed to qualify the estimated damage benefits.

Draft Environmental Statement

The draft environmental statement fails to recognize the value of overbank flooding on fisheries resources. Periodic flooding of wetland habitat not only provides spawning areas but also adds nutrients to the water and increases available foraging areas for fish. The final environmental statement should include a discussion of the benefits of flooding to natural ecosystems such as increasing growth rates of valuable bottomland hardwoods, maintaining wetland wildlife habitat, providing additional fish habitat, and improving stream quality.

We note that the National Register of Historic Places has been consulted to determine if there were any properties listed which would be affected by the project. The final statement should indicate that the most recent monthly supplement of the National Register was consulted.

Documentation of coordination with the State of Mississippi Department of Archives and History, pages 17 and 18, should include a discussion of all of the steps requiring consultation with that Department's Director, Mr. Elbert Hilliard who is the State Historic Preservation Officer (SHPO). The required

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steps are described in the Advisory Council on Historic Preservation (AHP) Procedures for the Protection of Historic and Cultural Properties (36 CFR 800).

The preliminary archeological survey conducted by Professor Richard A. Marshall during the period April 7 and 8, 1971, indicates the presence of ten archeological sites within the watershed. We understand that the Circle M. Site Village was judged by him to be potentially eligible for nomination to the National Register of Historic Places. We further understand that Professor Marshall recommended that more study was required. Additional survey work, performed by a professional archeologist, appears to be necessary in order to locate and identify other sites of potential cultural value within the entire area over which the project would have possible direct and indirect (secondary) effect.

In consultation with the SHPO the Criteria of the ACHP guidelines (36 CFR 800.10) must be applied to the located cultural properties to determine if there exist any properties, including the Circle M. Site Village, that appear eligible for inclusion to the National Register. In order to obtain a determination of eligibility you must make a request, in writing, to the Secretary of the Interior. Instructions for making a request are enclosed for your ready reference.

Environmental Impacts

Significant adverse impact related to geologic conditions is not anticipated.

Mineral resources including limestone, clay, bauxite, and sand and gravel are listed on page 12 of the statement. The statement also states there is currently no production in the project area. However, potential impact of the project on these minerals is not described regarding existing and future mineral activity in the basin.

It is estimated, (page 26, paragraph 2), that a 33 percent increase in floodplain croplands will result from the flood protection provided by the project. The final draft statement should discuss the increase in water pollution from sedimentation and pesticides in the area of project influence because of more expansive and intensive agriculture.

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There may be need to amend this section to include an assessment of the project's direct and indirect impacts upon cultural resources. For any cultural resource property found eligible for inclusion to the National Register the Agency Official, in consultation with the SHPO, must apply the Criteria of Effect (36 CFR 800.8) and, if appropriate, take additional steps required by the ACHP procedures.

Those measures to be taken to mitigate impacts to cultural resources should be discussed as appropriate. If it is found that properties eligible for inclusion to the National Register will be irreparably lost or destroyed then the requirements of the Act of June 27, 1960 (74 Stat. 220) relating to the preservation of historical and archeological data, as amended by the Act of May 24, 1974 (88 Stat. 174) must be fulfilled.

Adverse Environmental Effects

The following effects should be included in the list on page 31.

1. There will be an increase in water temperature where large trees and other bank vegetation are removed.
2. The acreages of various wetland types that will be lost or modified should be identified.
3. There will be an increase in water pollution with cumulative additions of salts, organic nutrients, and pesticides in the immediate project area and downstream because of more expansive and more intensive agriculture.

Consultation and Review with Appropriate Agencies and Others

This section should be expanded to reflect the results of cultural resources surveys and the consultative process required by the ACHP procedures.

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We hope these comments and suggestions will be of assistance to you.

Sincerely yours,



Deputy Assistant

Secretary of the Interior

Mr. W. L. Heard
State Conservationist
Soil Conservation Service
Department of Agriculture
P. O. Box 610
Jackson, Mississippi 39205

Enclosure



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DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

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- Mr. W. L. Heard
State Conservationist
Soil Conservation Service
P. O. Box 610
Jackson, Mississippi 39205

Dear Mr. Heard:

This is in response to your letter of 7 February 1975 addressed to the Commandant, U. S. Coast Guard concerning a draft environmental impact statement for the Shuqualak Creek Watershed, Noxubee and Kemper Counties, Mississippi.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

A handwritten signature in cursive ink that appears to read "W.E. Caldwell".

W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy Chief, Office of Marine
Environment and Systems
By direction of the Commandant

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

April 15, 1975

Mr. W. L. Heard
State Conservationist
U. S. Soil Conservation Service
P. O. Box 610
Jackson, Mississippi 38205

Dear Mr. Heard:

We have reviewed the Draft Environmental Impact Statement for Shuqualak Creek Watershed in Noxubee and Kemper Counties, Mississippi, and find that, while it shows benefits of the project and identifies and reflects the inputs and support by other agencies (both State and Federal), we feel there should be a more thorough evaluation and presentation of the alternatives.

It would be helpful to know why the relatively large percentage of the watershed upstream from Channel No. 3 is not also protected with a flood control impoundment. Numerous streams converge at the upstream end of this channel, suggesting that there is adequate elevation to offer suitable dam sites. The brief presentation of alternatives suggests that a structure there can be effective, but it is only presented as an alternative of channel work (with limited benefits) rather than as a supplement to channel work. We would like to see an evaluation of a structure at that location, coupled with either the presently proposed channel work or slightly reduced channel work, so as to maximize the protection and benefit cost ratio of the project.

In addition, in the discussion of alternatives, we suggest inclusion of a similar presentation of the presently proposed project both in the listing on Pages 32 and 34 and in the Table of structural alternatives evaluated on Page 34. A comparison of the benefit cost, as derived from the various alternatives, would also be helpful.

Finally, if wetlands are involved in the project, consideration should be given to implications pursuant to Section 404 of Public Law 92-500. The final impact statement should state what is to be done to protect wetlands and to secure a 404 Permit and/or EPA approval before the wetlands are treated.

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In view of the foregoing, we have assigned a rating of ER- (environmental reservations) to the project and 2 (insufficient information) to the Impact Statement.

We would like to have five copies of the final environmental impact statement when it is available, and if we can be of further assistance in any way, please let us know.

Sincerely,

for John C. White, Deputy
Jack E. Ravan
Regional Administrator

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

July 29, 1975

Mr. W. L. Heard
State Conservationist
U. S. Soil Conservation Service
P. O. Box 610
Jackson, Mississippi 39205

Dear Mr. Heard:

We have reviewed the Pre-Final of Shuqualak Creek Watershed,
in Noxubee and Kemper Counties, Tennessee, and find that our
comments on earlier drafts on this project are satisfied.

If we can be of further assistance, please let us know.

Sincerely,

David R. Hopkins

David R. Hopkins
Chief, EIS Branch

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STATE OF MISSISSIPPI
OFFICE OF THE GOVERNOR

WILLIAM L. WALLER
GOVERNOR

WM. M. HEADRICK
COORDINATOR OF FEDERAL-STATE PROGRAMS

STATE CLEARINGHOUSE FOR FEDERAL PROGRAMS

TO: Mr. W. L. Heard, State Conservationist
USDA, Soil Conservation Service
Post Office Box 610
Jackson, Mississippi 39205

State Clearinghouse Number
75020703

Date: April 3, 1975

PROJECT DESCRIPTION: Draft Environmental Statement and Watershed Work Plan for Shuqualak Creek Watershed project, Noxubee and Kemper Counties, Mississippi (January 1975).

(x) 1. The State Clearinghouse has received notification of intent to apply for Federal assistance as described above.

(--) 2. The State Clearinghouse has reviewed the application(s) for Federal assistance described above.

(--) 3. After proper notification, no State agency has expressed an interest in conferring with the applicant(s) or commenting on the proposed project.

(--) 4. The proposed project is: () consistent () inconsistent with an applicable State plan for Mississippi.

(x) 5. Although there is no applicable State plan for Mississippi, the proposed project appears to be: (x) consistent () inconsistent with present State goals and policies.

COMMENTS: The attached letter with enclosures from the Mississippi Board of Water Commissioners is made a part of this Final Clearinghouse action.

This notice constitutes FINAL STATE CLEARINGHOUSE REVIEW AND COMMENT. The requirements of U.S. Office of Management and Budget Circular No. A-95 have been met at the State level.

cc: East Central P & DD
Golden Triangle P & DD

E. A. May, Jr.
Edward A. May, Jr.
Clearinghouse Director





BOARD OF WATER COMMISSIONERS

416 NORTH STATE STREET
JACKSON, MISSISSIPPI 39201

354-7236

February 19, 1975

BOWC MEMORANDUM

SUBJECT: Watershed Work-Draft Environmental Statement:
Shuqualak Creek Watershed Project, Noxubee
and Kemper Counties

I have reviewed the above captioned material
and have found no major objection to the over-all project.

MISSISSIPPI BOARD OF WATER COMMISSIONERS

Larry J. Marble
Larry J. Marble

LJM:mm

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MISSISSIPPI STATE HIGHWAY DEPARTMENT

P. O. Box 1850 Jackson, Mississippi 39205

March 4, 1975

Reply To:

Mr. John E. Brown
Mississippi Board of Water
Commissioners
416 North State Street
Jackson, Mississippi 39201

Dear Mr. Brown:

The Draft Environmental Statement submitted with your letter dated February 11, 1975, has been reviewed by personnel in our Bridge Division. Based on this review, it has been determined that the proposed Shuqualak Creek Watershed Project, Noxubee and Kemper Counties, would have no significant effects on our highway facilities.

Sincerely,

W.K. Magee
W. K. Magee
ENVIRONMENTAL DIVISION ENGINEER

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Game and Fish Commission

STATE OF MISSISSIPPI

P. O. BOX 451 • PHONE 354-7333 • JACKSON, MISSISSIPPI 39205

COMMISSIONERS

FRANCIS S. BOWLING
CHAIRMAN
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WILLIAM WINTER
LIEUTENANT GOVERNOR

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SAM V. MORSE
GULFPORT

JOE L. TENNYSON
CHARLESTON

J. E. WOLFE
CLEVELAND

February 13, 1975

Board of Water Commissioners
416 North State Street
Jackson, Mississippi 39201

Gentlemen:

We have reviewed the Draft Environmental Impact statement on Shuqualak Creek Watershed dated January 1975, and do not wish to make any additional comments.

Very truly yours,

A handwritten signature in cursive ink, appearing to read "Barry Freeman".

Barry Freeman
Chief of Fisheries

BF:nj

RECD BY
MISSISSIPPI WATER COMMISSION





BOARD OF WATER COMMISSIONERS

416 NORTH STATE STREET

JACKSON, MISSISSIPPI 39201

354-7236

April 1, 1975

Mr. Edward A. May, Jr.
Assistant to the Coordinator
Federal-State Programs
Suite 400, Watkins Building
510 George Street
Jackson, Mississippi 39202

Subject: Watershed Work Plan - Draft Environmental Statement: Shuqualak Creek Watershed Project, Noxubee and Kemper Counties.

Dear Mr. May:

The statewide review of the above captioned Work Plan and Environmental Statement has been completed and the received letters of comment are attached.

Sincerely,

MISSISSIPPI BOARD OF WATER COMMISSIONERS

A handwritten signature in cursive ink that appears to read "Jack W. Pepper".

Jack W. Pepper
State Water Engineer

JWP:mm
Encls.

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REGIONAL CLEARINGHOUSE FOR FEDERAL PROGRAMS

Golden Triangle Planning and Development District
Post Office Drawer DN
Mississippi State, MS 39762
Telephone: 325-3855

TO: Mr. W. L. Heard
U.S. Dept. of Agriculture
Soil Conservation Service
P. O. Box 610
Jackson, MS 39205

DATE: February 21, 1975

PROJECT DESCRIPTION: Shuqualak Creek Watershed Work Plan

- (XX)1. The Regional Clearinghouse has received notification of intent to apply for Federal assistance as described above.
- (XX)2. The Regional Clearinghouse has reviewed the application(s) for Federal Assistance described above.
- (--)3. The organizations listed under "COMMENTS" have expressed an interest in the proposed project and () wish to confer with the applicant(s) and/or () wish to have their comments included with the formal application(s).
- (--)4. The proposed project is () consistent () inconsistent with the applicable county and the District OEDP's for economic development in the area.
- (XX)5. Although an applicable plan does not presently exist for the GTP&DD the proposed project appears to be (X) consistent () inconsistent with the regional goals and objectives.

{XX} Answered
(--) Not Answered

COMMENTS: This notice constitutes final regional Clearinghouse review and comment on the proposed Work Plan.

JWT/1b

cc: Mr. Ed May

John W. Thamas
Executive Director

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Base compiled at 1:31,680 (1 inch equals 1 mile) and
reproduced at 1:67,400 (1 inch equals .95 miles).
Base compiled from uncontrolled Mosaic 4-R-28585.
Total available USGS Quadrangles and General Highway
Map, Latitude and Longitude were taken from those sources.



